spital Library JUL 8 1930
PRESENTED BY DR. A. S. WARTHIN.

THE JOURNAL

OF THE

Michigan State Medical Society

ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

MEDICAL KNOWLEDGE AND WISDOM

Knowledge is power. Knowledge is valuable but wisdom is invaluable. "Wisdom is better than rubies." Intellect is not wisdom. The academic mind is intelligent, not necessarily wise. Wisdom is knowledge plus art, experience, intuition, sympathy and understanding. Knowledge is cold and formal. Wisdom has warmth and feeling. Wisdom is capacity to use knowledge with reference to life and conduct as most conducive to true happiness and glory. Knowledge has not accomplished mastery of human nature. Wisdom is the intellectual good taste to appraise values and the proper application of knowledge. But even Socrates disclaimed wisdom while he expressed his desire and admiration for it.

H. E. RANDALL, M.D.,
Former President of the State Medical Society.

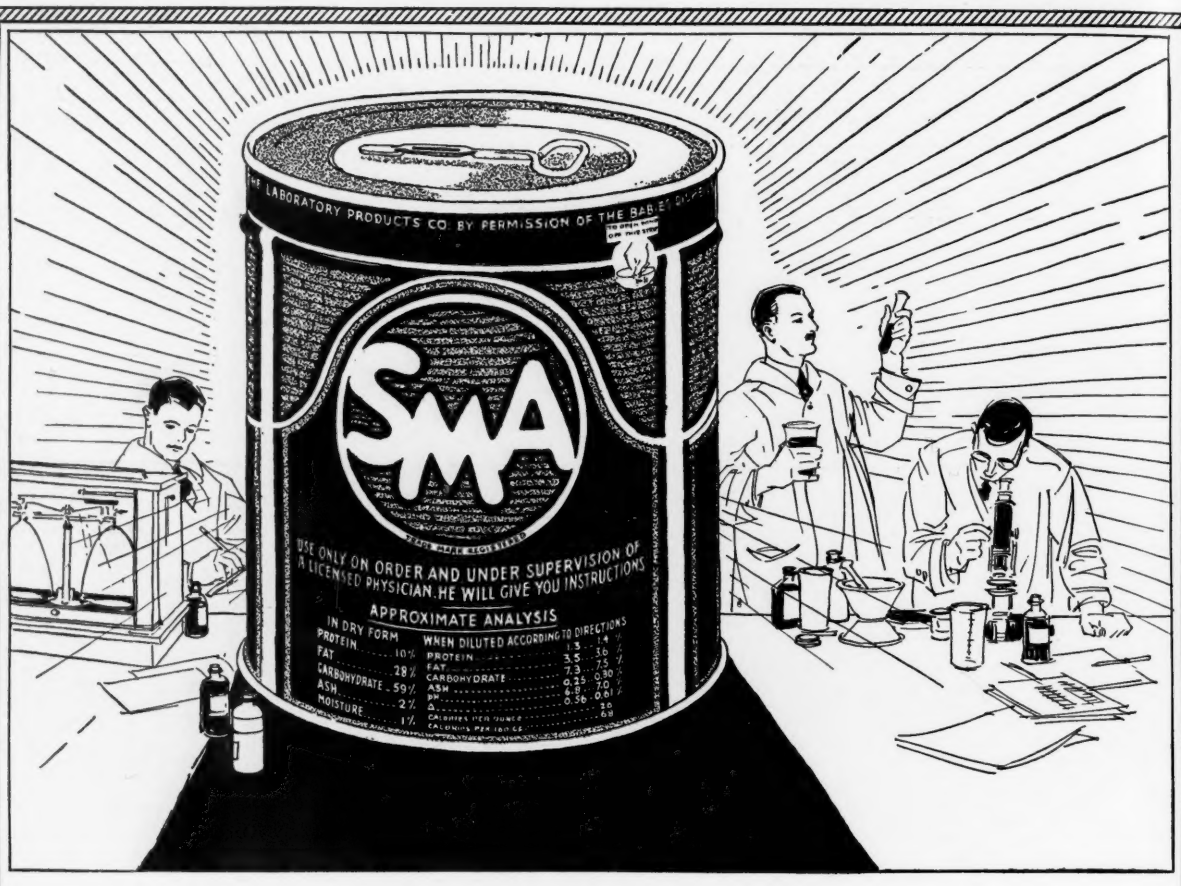
Volume XXIX **JULY, 1930** **No. 7** [Whole No. 335]

YEARLY SUBSCRIPTION $5.00--SINGLE COPY 50 CENTS

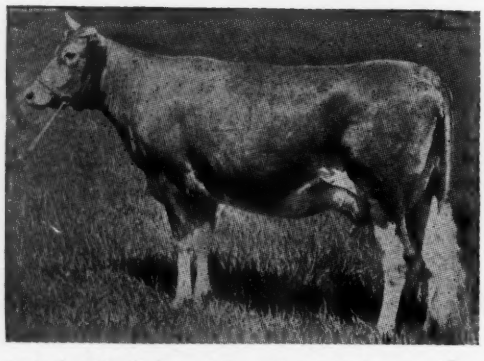
Annual Meeting, Benton Harbor, Sept. 15-16-17, 1930

PROPERTY OF THE PATHOLOGY DEPARTMENT

"Copyright 1930 by the Michigan State Medical Society"


THE LABORATORY PRODUCTS CO. BY PERMISSION OF THE BABIES DISPENSARY
SMA
USE ONLY ON ORDER AND UNDER SUPERVISION OF A LICENSED PHYSICIAN. HE WILL GIVE YOU INSTRUCTIONS
APPROXIMATE ANALYSIS
IN DRY FORM
PROTEIN 10%
FAT 28%
CARBOHYDRATE 59%
ASH 2%
MOISTURE 1%
WHEN DILUTED ACCORDING TO DIRECTIONS
PROTEIN 1.5 - 1.4 %
FAT 3.5 - 3.6 %
CARBOHYDRATE 7.3 - 7.5 %
ASH 0.25 - 0.30 %
PH 6.8 - 7.0
Δ 0.56 - 0.61
CALORIES PER OUNCE 20
CALORIES PER LITRE 670

Your careful observations...



Only fresh milk from tuberculin tested cows, from dairy farms that have fulfilled the sanitary requirements of the City of Cleveland Board of Health, is used as a basis for the production of S. M. A. Our dairymen receive from 30 to 50% above market prices for their milk as a premium for its high quality.

... with S. M. A. will reveal that while it is ***possible*** to prescribe less expensive formulae, none other have such outstanding features as dependability of results, completeness of composition and extreme simplicity of preparation. There is only ***one*** S.M.A.

S. M. A.

Fine Products for the Infant's Diet

© The Laboratory Products Company • Cleveland • San Francisco • Toronto • London

THE JOURNAL

OF THE

Michigan State Medical Society

ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

VOL. XXIX JULY, 1930 No. 7

CONTENTS

Physiologic Considerations in the Treatment of Chronic Constipation. Walter A. Bastedo, M.D. 483
Corns, Hammer-Toes and Bunions. J. G. R. Manwaring, M.D. 497
The Present Status of Radiation Therapy in Pediatrics. Ernst A. Pohle, M.D., and Horace R. Tenney, M.D. 500
The Treatment of the Occiput Position. M. Edward Davis, M.D. 503
Episiotomy. J. Campbell Smith, M.D. 506
The Diagnosis of Ectopic Pregnancy. James M. Pierce, M.D. 509
An Unusual Anomaly of the Pelvis. W. M. Dugan, M.D., and W. O. Upson, M.D. 512
Physiology of Menstruation. Russell W. Alles, M.D. 516
Plantar Warts. Cyril K. Valade, M.D. 521
Michigan's Department of Health. C. C. Slemons, M.D. 524

Editorials:
Medical History of Michigan 527
Post-Graduate Medicine 527
The American Medical Association 528
Chronic Constipation 528
Licensing Board 528
Oursel's as Ithers See Us 529
Cancer Cures 530
Illustrations 530
Society Activity 532
General News and Announcements 535
Communications 537
Woman's Auxiliary 538
County Societies 538
The Editor's Easy Chair 539
The Doctor's Library 542
Medical History of Michigan
Review by Dr. J. B. Jackson.
Of Medical and Surgical Interest 544

PHYSIOLOGIC CONSIDERATIONS IN THE TREATMENT OF CHRONIC CONSTIPATION*

WALTER A. BASTEDO, M.D., Sc.D. (Hon. Columbia)†
NEW YORK

Under this heading, were I an apple grower, I might speak to the proposition that "An apple a day keeps the doctor away"; or as a merchant I might extol the latest fad, psyllium seeds, appropriately by some vendors called Psylla, only for every Scylla there may be a Charybdis. But as a physician rather do I choose as my text a paraphrase of the words of Voltaire: "A 'No' from one who has a regular and satisfactory bowel movement every day is more gracious than a "Yes from one who is habitually constipated" (after Hurst). In these words is expressed the reason why constipation is a subject for treatment, not that the bowels fail to move but that associated with that failure there are undesirable effects on the person.

Constipation is usually and properly defined as inadequate defecation. But can adequacy in this connection be measured with a machine like basal metabolism, or weighed or proved chemically? Is defecation inadequate in the subjective sense and based on the feeling of the patient that the bowels have not moved sufficiently; or is it inadequate in the objective sense, the bowels failing to move according to an arbitrary timetable set by you or me or somebody else? Horace Fletcher, the apostle of Fletcherism, claimed to have had a movement about once

*Read at a joint meeting of the American Proctologic Society and the Medical Society of Wayne County at Detroit, Mich., May 14, 1929; also at the University of Buffalo and the Syracuse Academy of Medicine.

†Dr. Bastedo was educated at Toronto University and also the College of Physicians and Surgeons of Columbia University. He was interne at St. Luke's Hospital, New York 1899-1901; attending physician of the City Hospital, New York, 1914-1920; Assistant Professor of Clinical Medicine in Columbia University since 1917. He is now consulting physician to St. Luke's Hospital, New York; President of the U. S. Pharmacopeial convention 1930-40 and last year was awarded the honorary degree Sc.D. by Columbia University.

a week, and that a small movement, at a period when his health was the best in his whole life; and there are on record not a few instances of people who have moved the bowels only once a week, once a month, or even once in three months and yet suffered no ill health. On the other hand there are healthy people who have several movements a day throughout life, there are many with diarrhea who insist that their defecations are inadequate, and there are those who have a daily movement or a number of small movements who can be proven objectively to be constipated. As to the consistency of the feces Burnett insists that we should have dried out lumpy feces like a dog's, while a group in England advocate several mushy movements a day like those of a cow.

The method and rate of passage of some particular material through diseased bowels is often an unanswered riddle. Even in normal young men with good digestion and daily bowel movements Alvarez and Freedlander found that most took four days before beads given by mouth were all passed in the feces and some required nine days to pass as many as 50 to 60 per cent. One constipated person did not pass the last of the beads until the fortieth day. In persons not constipated I have noted that readily recognizable foods like peas, corn and spinach have varied in their time of passage in the same person from one to four or five days. In any event, therefore, we must acknowledge that "The rate for the passage of intestinal contents varies within wide limits for healthy individuals" (Hurst), and that the lack of a certain number of movements per day or their failure to have a certain consistency cannot be a wholly satisfactory criterion for the diagnosis of deranged bowel movements. For practical purposes, however, I believe that in those who are constipated we should aim to secure daily one or two stools of formed, but not hard, sausage type and of no pronounced odor.

Scope. In this review we shall not speak of surgical conditions except incidentally. Everybody knows that an esophagus patient cannot swallow enough food to make the bowels move, that pyloric obstruction is a bar to rate of travel high up in the alimentary tract, and that a cancer or gumma of the bowel or tuberculous peritonitis will result in intestinal stasis. But in these the constipation is only an incident. We shall also refrain from discussing small intestine constipation except so far as its ileocecal terminus is concerned, for clinical constipation of the small bowel is not common and as a matter of fact is almost always due to lead poisoning. In a study of five men undergoing voluntary constipation, Donaldson noted the interesting fact that in spite of persistent failure of defecation for three or four days the small bowel continued to empty its contents into the large at a normal rate. Nor shall we speak of acute constipation or the type that benefits by a weekly or monthly pill. We confine our remarks to habitual or chronic constipation.

PHYSIOLOGY

The movements of the colon are very inactive, hence most studies of the intestine have been made upon the smaller gut. But, however sluggish, as a smooth muscle organ the colon has the properties of irritability, tonicity and contractility. *Irritability* is sensitiveness to stimuli. *Tonicity* is a property of the resting period. In a hollow viscus like the bowel tone gives the resistance to dilatation and maintains the intraintestinal pressure during the period *when the organ is not actively contracting.* High tone in a segment of the bowel makes for narrowing of the lumen and small capacity, poor tone favors dilatation and large capacity. *Contractility* relates to the active shortening or contraction of the muscle fibers. In a properly toned bowel distention by its contents is a stimulus to contraction.

In the colon there are several types of contraction, and for an understanding of colon functions these must not be confused. They are: 1. *Antiperistaltic waves* which, though weak, are important for they hold back the contents for absorption in the cecum and ascending colon. Without them the liquid material discharged in jets through the ileocecal sphincter might run right through the bowel. They may continue until the cecum and ascending colon are filled up or even distended. Then they alternate in periods with the peristaltic waves. 2. *Peristaltic waves* which appear normally in the proximal colon and alternate in periods with the antiperistaltic waves to churn the liquid contents back and forth and so favor absorption. Also by slow progression they push the concentrated contents into and along the transverse colon. They have fre-

quently been observed as weak waves, but Todd avers that normally they are only slightly less vigorous than those of the stomach. In the descending colon and sigmoid flexure vigorous peristaltic waves occur only when the contents are mushy or liquid. After a laxative, in diarrhea or in response to an enema, active peristalsis may predominate throughout the whole colon, a condition which is abnormal and ordinarily undesirable. 3. *Haustral contractions* or tonic rings which cause the normal sacculation of the colon. They may be powerful and persistent, continuing sometimes for a long time without motion. *They have no essential propulsive effect.* Not infrequently a tonic ring separates the cecum from the ascending colon, but the true haustral contractions belong mostly to the transverse colon where the condensed feces are firmly gripped in segments and held for a long time to permit still greater concentration. In the non-absorbing descending colon the tonic rings may be absent or when present may hold the desiccated segments tightly in the form of balls. 4. *Contractions in the three longitudinal bands* which divide the circumference of the bowel into three sacculations, act as fulcra for the circular muscles and probably assist in the onward progress of the contents. The colon in activity may be drawn together so that it is less than half as long as when at rest or post mortem. 5. *Mass waves,* which occur but rarely and cause a mass movement of the contents for several or many inches in the space of a few seconds or a minute or two. Of these five types of contraction *the mass waves are normally the only strongly propulsive ones.* The greatest normal stimulus to their occurrence is eating, especially after a long period of fasting, as at breakfast. In watching with the X-rays every hour Hurst found that there was very little advance of the contents except during or after each meal, when the advance was sudden and rapid. This observation has been repeatedly corroborated by others.

The colon then is a sluggish muscular organ and its contents are not only not being propelled forward all day long, but are actually being retarded. In the cecum and ascending colon the contractions are not haustral in type and by absorption the contents are continually being concentrated so that when they reach the distal transverse they are no longer liquid. In the transverse colon the resistant material is gripped in the haustral segments and held for a long time for further absorption. Then two or three times a day, or perhaps several times, the haustra in the mid and distal transverse colon suddenly disappear and the fecal material comes together into a sausage several inches long, which in a few seconds or minutes passes into the descending and iliac colons. After normal defecation till such a mass movement takes place these parts are usually empty or nearly so, though sometimes at defecation the contents of the transverse colon follow into the descending colon to leave it partly filled. As the day progresses two or three such mass movements fill up the terminal colon, the contents of which are kept from going farther by the sigmoid rectal apparatus. This, the narrowest part of the whole large bowel and a highly irritable area, is ordinarily found in a state of tonic contraction which enables it to hold back formed or dense feces and sometimes even liquid ones.

Thus the concentrated feces ready for expulsion are stored in the iliac and descending colons so that defecation is conveniently deferred to once or twice in twenty-four hours. But the rectum normally remains empty till defecation and there is no capacious left-sided reservoir for the storage of feces, as sometimes supposed, but all parts of the gut on the left side are strikingly smaller than the cecum and ascending colon. Any exception to this means a pathological state.

DEFECATION

Customarily, because of the morning meal and probably in addition because of the activities of dressing and the effect of habit, a mass movement takes place and forces some of the dammed up contents into the rectum, which till then remains empty. This gives the desire to defecate and urges one to the toilet where voluntary action comes into play to increase the intra-abdominal pressure and force more feces into the rectum. These in turn cause defecation reflexes which result in a great mass movement in the colon, activity of the rectal and levator ani muscles, correlated relaxation of the anal sphincters and a movement of the bowels. Tone in rectum and sigmoid is normally higher than that in the colon above, so if the bowels are not voluntarily made to move when the desire comes the feces may pass

back into the descending colon and even into the transverse. Or if the rectal tone is low the feces remain in the rectum. In either case frequent repetition of this failure to heed nature's call tends to lessen the defecation reflex and so favors the development of constipation.

The normal stimulus to contractions of the colon whether propulsive or not is distention and stimulation by the contents. The normal stimulus to propulsion is eating. The normal stimulus to defecation desire is feces in the rectum. But to produce defecation and continue it voluntary action is necessary. (In certain patients with central nervous lesions or in coma this may not be the case.)

Causes of Constipation

HYPERTONY

The most important muscular cause is overaction of the retarding mechanisms. Of these there are at least four, which are situated (a) at the ileocecal sphincter region, (b) in the ascending colon and adjacent transverse, where antiperistaltic waves tend to keep the cecum and ascending colon filled, (c) in the transverse and descending colons where the tonic rings or haustral contractions firmly oppose progress, (d) in the descending-sigmoid narrowing. In addition there is a retarding mechanism in the region of the anus and the rectal valves above it. The action of these restrainers is to hold back the column of contents, and without them our food might rush right through us, a procedure which, aside from its inconvenience, might result in our starving to death. But over-irritability or overtone of any one of these restrainers may produce abnormal retardation with resulting constipation. Such overtonic retardation in the colon makes for "hypertonic constipation," sometimes incorrectly spoken of as "spastic constipation." With all hypertonic retardations we must be cautious in the use of irritant drugs or foods, for depression rather than stimulation is the requirement.

ATONY AND HYPOTONY

On the other hand we may have atony or undertone at some portion of the tract, especially in the ileocecal sphincter, the cecum, the ascending colon and the rectum. The ileocecal orifice is a true sphincter and its function is a triple one, viz. (a) to hold back the food materials in the ileum so that they may be digested and absorbed, (b) to relax intermittently and let the ileal contents into the colon in jets, and (c) to prevent reflux of material from the colon. An atonic or relaxed ileocecal sphincter not only permits the food material to pass too rapidly into the colon but in addition may allow the fecal material to regurgitate into the highly absorptive ileum and thus may be a cause of toxic states.

A capacious storage reservoir on the left side without atony may be encountered in pathological states, as for example in acquired megalocolon or megalosigmoid or when there is great redundancy of the left colon; and distention of the cecum and ascending colon is frequently seen when this part which has a relatively weak musculature is unable to overcome a hypertonic constriction further along the tract. But these are not cases of atony and my observations tally with those of Sir Arthur Keith, Hurst, Alvarez, Soper and others that while relatively poor tone is frequently encountered, actual atony of the muscle in any part of the bowel is a rarity.

Aside from the conditions mentioned, important factors in the production of chronic constipation may be (a) a lack of material for propulsion, as in undereaters, over-digesters and others whose food supplies too little bulk of residue, (b) a *chronic appendicitis* with ileal stasis or a *cholecystitis* with flatulence or (c) the *mechanical factors* of poor intra-abdominal pressures and pelvic crowding. These are strikingly seen in the hyposthenic or asthenic individual with such a poor abdominal wall and undertoned pelvic floor that it is difficult to raise the intra-abdominal pressure to a sufficient degree. When in addition the cecum occupies the pelvis, the hepatic flexure flops down into the iliac fossa, the mid-transverse is below the pelvic brim, the sigmoid is long and redundant, and these together with much of the small intestine are crowded into the true pelvis, with perhaps in addition a retroverted uterus or an enlarged and irritable prostate, our only wonder is that such a person should ever have bowel movements at all.

PTOSIS

In regard to what constitutes visceral ptosis there have been several excellent researches both in England and this country.

In a study of one thousand healthy students and instructors at the University of California, with no history of bowel trouble, and about equally divided between men and women and between athletes and non-athletes, Moody and his collaborators found that in the erect position the greater curvature of the stomach was below the level of the iliac crests in 75 per cent of the males and in 88 per cent of the females, and that the lesser curvature reached below this level in 12.9 per cent of the males and in 33 per cent of the females. The cecum was in the pelvis in 63 per cent of the males and in a greater percentage of the females, and a substantial segment of the transverse colon was wholly below the crest-line in practically all and over four inches below in 33 per cent of the males and 49 per cent of the females. The English observers noted still higher percentages of low organs; for example, the cecum was in the true pelvis in 91 per cent and the greater curvature of the stomach was below the iliac crest level in 87 per cent of males and 96 per cent of females.

Moreover, at the University of London in a study of the films taken of 100 patients over forty whose complaint was gastro-intestinal trouble, the position of the stomach and colon averaged higher in the abdomen than in those without disturbances of the digestive tube (Moody). *Obviously we must be guarded in making the diagnosis of ptosis as a clinical entity, and especially in attributing constipation to a low position of viscera.*

INSENSITIVENESS

As the stimulus to defecation requires sensations from the rectum and as voluntary actions are necessary for defecation it is not surprising to find a lack of desire to go to stool and consequent constipation in those taking large amounts of sedative drugs such as morphine, bromides and the barbituric acid series. These patients fail to recognize the presence of feces in the rectum. A similar condition exists in some insane, and in those with tumors or scleroses of the spinal cord or lesions of the sacral nerves, and in some instances in those with apoplexy involving the sensory apparatus.

FECAL IMPACTIONS

Common enough are these in old people, in the debilitated and in those taking morphine, but also at times we encounter quite large fecal tumors in the young. And the interesting fact is that *in such cases there is usually an overflow diarrhea* which deceives the physician who does not examine the rectum. In a girl of eleven with diarrhea and an enormous tumor filling the whole left side of the abdomen and extending two inches beyond the midline and to the epigastrium we thought we might be dealing with a sarcoma. But as the mass could be indented with the fingers and on the release of pressure conveyed a sticky feeling like feces we instituted enema treatment, and in five days had removed the whole tumor which consisted entirely of feces. Yet she came to the hospital for diarrhea. A girl of nineteen admitted for diarrhea, a sudden onset of which had followed prolonged constipation, presented a large abdominal tumor which was discovered at operation to be a free mass in the lumen of the transverse colon. It was like a hard ball, weighed 945 gm. (about 2¼ lbs.) and was composed of cereal husks, fruit seeds, vegetable fiber and other plant parts, the result of efforts to overcome the constipation by roughage diet. Yet her complaint was diarrhea.

MENTAL AND NERVOUS STATES

Through effects on the involuntary nervous control mechanism minor states of mental disequilibrium may exert a profound influence on the bowels to produce either constipation or diarrhea. Indeed Todd states that the colon forms a reliable index of subconscious mental strain or excitement. Even in people whose bowels usually move normally it is a common experience that when worried or anxious to hurry the movement, they are unable to move the bowels even though the defecation desire is strongly present. Under nervous strain the defecation reflexes may fail to make a proper correlation between the various mechanisms involved in having a stool.

HYPOTHYROIDISM

In certain persons with chronic headache and constipation accompanied by a low basal metabolism, I discovered some years ago that thyroid extract not only caused the headaches to disappear but also in some of them resulted in normal bowel movements. Since then I have found that in hypothyroidism, whether there is headache or not, this is sometimes, though not by any means

always, the action of thyroid medication on the bowels. Brown of Johns Hopkins has recorded similar observations.

Upper rectum or sigmoid constipation is commonly due to hypertonicity of the recto-sigmoid contracture, but it may also be due to hypotone with invagination of the sigmoid into the rectum, or to a bound down retroverted uterus, an enlarged and prolapsed ovary, pelvic adhesions or some chronic pelvic inflammation, even pelvic appendicitis. *Lower rectum constipation* is due to anal irritations, prolapse, hypertrophied valves, prostatic irritation, lack of rectal sensation and lack of muscle power above the anus frequently caused by a rectocele. This last makes a large reservoir above the anus, and in rectocele patients in the vaginal position asked to bear down as if having a stool, I have seen the recto-vaginal wall pushed right through the vulvar opening without any sign of relaxation of the sphincter ani.

DIAGNOSIS

This rests on the history, the physical examination, the amount and character of the food eaten and the stools passed, charcoal or carmine tests and X-ray pictures. In the physical a rectal examination is essential, for many constipated people owe their retarded defecation wholly to difficulties in the last few inches of the alimentary tract. Feces in the rectum normally give the desire to defecate, therefore a person with a substantial amount of feces in the rectum without this desire has *rectal constipation.* Furthermore even with the desire if the patient cannot succeed in defecating owing to some rectal or anal condition, the constipation is of the rectal type.

Much information can be obtained by giving ten grains of carmine or half a dozen charcoal tablets with the noon meal. We can expect some of the pigment to appear in the stools of the next day, and are justified in making a tentative diagnosis of constipation if it does not. Furthermore, if the pigment appears plentifully in the morning stool and is practically all finally excreted the following day, we may confidently say that constipation does not exist. By this test we discover that many people who complain of constipation do not have it.

Radiographs contribute much to the diagnosis but for proper interpretation the examination should be preceded by a two-day period on the usual diet and without laxative drugs, and should include prone, erect and lateral pictures of a barium enema. Moreover, conclusions should not be drawn from a single gastro-intestinal series. Frequently under the roentgen rays, especially in a patient taking roughage food and laxatives, the colon may be seen highly tonic and overactive at one examination, whereas after a few days of more kindly treatment its tone and activity are entirely normal. Furthermore, a barium enema should not be accepted as revealing the usual activities of the colon but rather the special effect of an enema upon it.

When we have our patients roentgenographed we must not be too ready to diagnose malposition as the cause of intestinal stasis, to view as usual the activities of the bowel in a patient who has taken laxatives or a brisk cathartic, to judge that there is atony because some proximal segment is dilated and slow in emptying, to misinterpret haustral contractions as peristaltic waves, to consider pathological a tubal descending colon or the collection of its contents into balls, to think that an opaque enema is revealing the usual activities of the colon, particularly if this enema has been preceded by a cathartic, or to assume that a sigmoid or colon distended by an enema shows its normal size and state.

TREATMENT

The prime requirement of the patient is that the bowels shall move adequately. But we have learned that through retardation in the ileum and colon a great amount of liquid material is transformed into such a small amount of feces that it demands expulsion only once or twice a day, and that to propel this liquid too rapidly is unphysiological and harmful. Unfortunately for our therapeutic understanding most of the studies of drug actions upon the colon have been made with small muscle strips suspended in saline to which the drug is added, or with the colon *in situ* activated by large purgative doses. We know of no proper studies that have taken into account the facts that the normal activities of the colon are largely restraining, and that active propulsion takes place only very occasionally. Hence we have difficulty in relating our drug actions to our needs and are too prone to use remedies with the sole idea of increasing peristalsis, an

idea which our studies have shown is not a correct one.

In any case to use our remedies intelligently we must be informed about their known actions, for the whole philosophy of the practice of medicine may be involved in attempts to answer the therapeutic why and when. Why in a particular case do we prescribe figs and bran rather than a bland diet with senna, why cascara instead of mineral oil or milk of magnesia, why epsom salts rather than castor oil? When shall it be enemas, when food, and when drugs, or when is it none of these but something outside of the alimentary tract that requires our attention?

In speaking of the treatment of constipation Dr. Arthur F. Hurst says: "I sometimes wonder whether (the colon) is not more sinned against than sinning, for what with attacks from above by purges, attacks from below with douches and frontal attacks by the surgeon, its sorrows are numerous and real." And I might add that, since the professional dietitians and newspaper medical columnists have adopted the slogan "Treat 'em rough," the poor colon must in addition nowadays suffer from a constant machine-gun bombardment of figseeds, bran and all that constitutes the great food category known as "roughage."

In *rectal constipation* it is needless to foist a lot of laxative drugs and coarse foods upon the whole alimentary tract, though to make the patient believe this it may be necessary to demonstrate by X-rays that the bowel above the rectum is functioning normally and that the feces are down in the rectum ready to be expelled. When due to atony or diminished sensitiveness rectal constipation usually can be overcome by daily efforts to have a stool at a regular time, preferably after breakfast, by paying attention to the slightest sensation of desire to defecate, by keeping the feces soft with mineral oil by mouth, by the administration of strychnine to promote tone and sensitiveness (this action of strychnine has not been proven pharmacologically) and by local treatment. This may be a glycerine or cocoa butter suppository or a small enema of a cup of water on arising to open the sphincter, or the instillation of 2 or 3 ounces of olive oil at bedtime to be retained over night. Such an amount of oil can be conveniently inserted by the patient with a soft rubber ear syringe. At times enemas must be used daily, for large fecal accumulations which interfere with the restoration of tone must absolutely be prevented.

If the trouble is a *rectocele* surgery is indicated; or short of surgery, a softening agent by mouth to prevent hardening of the feces and something to open the sphincter. If *painful hemorrhoids,* a *fissure* or *irritated crypts* are the fault, a softening agent by mouth, the injection of oil at night and a 5 grain anesthesin suppository in the morning usually give relief. But if not or if the trouble is some other baffling condition the patient should be referred to a proctologist. Alvarez pertinently remarks that "The physician who does not often pass an anoscope has no idea of the frequency with which constipated patients present a reddened, irritated and fissured anal ring with hemorrhoids and inflamed crypts."

In *irritations of the rectosigmoid apparatus or the descending colon-sigmoid region,* which are not infrequently accompanied by diverticulitis, my treatment consists of mineral oil by mouth and rectal injections of oil to be retained over night. Soper is enthusiastic over the injection through a rectal tube of two ounces of a 25 per cent magnesium sulphate solution, at first every day, then two days out of three, then every second day and finally once a week.

But *if the site of the constipation is higher up,* then our problem may be a more difficult one. People do not come to the physician for a slight sluggishness of the bowels, but usually have tried sundry dietary and proprietary remedies. Therefore, having satisfied ourselves that there is no retroverted uterus or other surgical condition to deal with and having arranged for an abdominal support if there is a lax abdominal wall with ptosis we begin our treatment by education and laxatives. The stock advice of an educational kind is about as follows: Whether you feel like it or not, go to stool every morning about the same time. When the desire to defecate comes do not postpone going to stool. Take plenty of exercise. Drink a lot of water. Eat a sufficiency of good mixed diet which contains plenty of roughage. You all know these rules. They are good rules and are the standbys of the profession. But—

Exercise does not necessarily make the bowels move. Dr. Meylan, Athletic Director at Columbia, has told me that among

the students taking active gymnasium work over thirty per cent are constipated, and a number of my patients with chronic constipation have been professional or college athletes, gymnasium instructors, horsemen who spend much of their time in the saddle, day laborers, diggers, longshoremen, etc., compared with whose daily performance five miles or 36 holes of golf are a mere bagatelle. On the other hand many persons of completely sedentary life have no constipation. Yet exercise has real value when it has the effect of improving the appetite and the general tone, and especially is this likely to be true of outdoor exercise. Whether or not special exercises for the abdominal muscles help more than general exercise there is some doubt; but one might favor such exercises as working the abdominal muscles in and out with the chest set, raising the legs while lying on the back, and bending the trunk forward and back or from side to side or in a circular movement.

Water does not necessarily make the bowels move. In a study of a patient with a cecal fistula Beutenmuller found that plenty of water with the meals hastened the arrival of the food residues at the cecum and increased the liquidity of the cecal contents. This is a common observation after operations on the ascending colon. But in a number of non-digestive patients we found that the ingestion of a glass of water every hour for fifteen hours daily for one week, almost a gallon a day, did not increase the bowel movements and served merely to activate the kidneys. Nevertheless water is the medium of movement and exchange in the body; therefore, while excess of water has no direct laxative effect, too little may result in feces of a dried out constipated type. In this sense water may act as a softening and bulk-producing agent. In some people a large bulk of water taken on arising may cause the bowels to move.

UNDEREATING

Normal food in normal amounts is the cause of normal defecation in normal people; and habitual undereating of food, or the taking of pap types of food which are too completely digested is prone to result in constipation. This occurs in rundown conditions, is habitual with some women, is a requisite for those who have had the teeth removed and is ordered by some physicians. As an example, how could this secretary expect her bowels to move when for breakfast she took one slice of bread and butter, marmalade and tea, for luncheon a single sandwich and a cup of coffee, and for dinner, which she and her sister prepared after their return from work, a small amount of meat, a piece of potato and one other vegetable, with no soup, no salad and no dessert. She was usually too tired to eat her dinner, weighed eighty pounds and took abundant daily cathartics. She was helped much by food and rest, but for a long time required the assistance of a softening agent and a tonic laxative. Even among those with means and plenty of time, especially the chronic invalids of the mucous colitis type, there are many who undereat, frequently because of a fear that this, that or the other food will disagree with them. Especially are women prone to overlook breakfast which is a normal stimulus to bowel movement.

As a rule so long as undereating continues, cathartic measures will have to be continued, therefore for those with little appetite and but slight interest in their meals it is well to begin by explaining the matter and then to advise three meals a day of properly assorted foods and adequate liquid. In addition they should endeavor to improve the appetite by outdoor exercise if possible and a rest period. One might even prescribe appropriate bitters before the dinner. In regulating the diet it is wise to figure not only on its content of adequate residues, calories and vitamines, but also on its variety and palatability so that the patient will eat it. A monotonous specified diet will rarely bring success for more than a brief period. It is a good plan to have suspected undereaters submit an exact list of the foods and fluids ingested for three days, specifying the helpings of food taken as small, average or large. A study of such a list frequently reveals dietary errors.

FOODS

The value of foods in moving the bowels may be rated according to their constituents. They act (1) by increasing the bulk of the intestinal contents, as by their structural parts, such as cellulose, skins, etc., and by unchanged oils and fats; (2) by mechanical irritation, as by seeds, husks, bran and coarse fiber; and (3) by chemical or drug action, as by sugars, laxative fruit acids and their salts, and fatty acids and soaps formed from

the fats and oils. In any case to give the stimulus of distention there must be an adequate amount of residue, and this is chiefly furnished by cellulose and other plant parts.

Residues may be classed as bland residues and roughage. Foods that leave bland residues alone are milk, cheese, lactose, fruit jellies, raw white of egg, white bread, the branless cereals and the starchy vegetables such as potatoes and rice. Foods that leave notable roughage residues are bran, the bran cereals, whole wheat, graham or bran breads, the fruits, and certain vegetables such as carrots, beets, squash, parsnips, oyster-plant, tomato, celery, turnips, the cabbage family, lettuce, beet-greens and spinach.

Hurst reports that of the dry substance of meat, eggs, white bread and rice only five per cent appeared in the feces, while of the dry substance of green vegetables and brown bread, fifteen per cent, and of the dry substance of carrots and turnips twenty per cent was recovered. The feces of a mixed diet gave 100 grams of water and 35 grams of dry substance; the feces of a vegetable diet, 260 grams of water and 75 grams of dry substance.

FATS

In hospital patients at the Mayos' Florence H. Smith found that when the bulk of fruit and vegetables reached 800 grams the movements were normal, but that when it was dropped to 600 grams there were many complaints of constipation. On the other hand even with moderately low vegetable and fruit residues if the amount of fat was high the bowels moved. But McLester objects to high fat diets on the ground that they may make an alternating diarrhea and constipation and that their fatty acids may set up a colitis, and Dixon suggests that excessive fatty acids rob the organism of bases. In any case fats belong to the class of irritant drugs for they form soaps and fatty acids, and as a matter of fact diets with excessive fat content are not especially digestible and are not acceptable to most people.

PROTEINS

Major John Bryant, Director Convalescent Department, Walter Reed Hospital, during the war, established a routine diet in which meat or eggs were allowed at one meal a day only. There were no complaints, but on a change to meat or eggs at each of the three meals daily there was an immediate increase in the digestive disorders and "every nurse on duty reported with astonishment a sudden and almost universal demand for cathartics." Is it not possible then that in some cases less eggs and meat rather than more roughage may be the best procedure?

FRUITS

Fruits furnish considerable indigestible roughage and other residues which tend to give a laxative effect; and they may also be laxative through the cathartic acids and salts which they contain. For example, orange, lemon and grape-fruit contain potassium citrate and also free citric acid which forms sodium citrate in the bowel. Thus the eater of the fruit obtains a dose of laxative citrate. Grapes contain potassium bitartrate or cream of tartar which becomes Rochelle Salts in the duodenum. Orange juice and orange are different foods, for the juice consists largely of a solution of a saline laxative, with vitamins, while orange itself constitutes roughage, the stools invariably containing chunks of orange tissue and many orange cells full of unliberated orange juice. The same may be said of grape-fruit. Alvarez states that pineapple is constipating.

Bran is given in constipation for two reasons, that it is indigestible and that it furnishes vitamins, notably Vitamin B, which is fundamental for the production of appetite and bowel movements. In a number of mild cases it is a successful remedy. But Hedblom and Cannon have demonstrated that coarse branny food stimulates gastric peristalsis and Osborne and Mendel that it is irritating both in stomach and intestines. It is therefore contra-indicated in hyperacidity, mucous colitis, hypertonic constipation and other states of gastrointestinal irritability. This restriction applies also to bran containing cereals and graham and whole wheat bread. Post and others have reported cases of obstruction of the bowels in children by impaction of bran given to move the bowels.

Being newspaper educated your patient will probably already have tried out many anti-constipation foods, for only after he has found them to fail does he consult a doctor. But the residues are such because they are indigestible, for if they were not indigestible there would be no residue. And there are many cases in which coarse indi-

gestible roughage or acid fruit may induce irritation in a sensitive stomach or bowel or result in an abnormal production of gas, and because of this not only harm the patient but fail to overcome constipation and in some instances actually increase it. Indeed in many of these cases the stoppage of coarse fruits and vegetables permits the bowels to move normally. With a sensitive stomach or an irritable bowel, bland foods with doses of mild laxatives will do more good and less harm than the coarse indigestible and fermentable messes that are so frequently swallowed to overcome constipation.

That I am not alone in this opinion is shown by quotations from authorities on foods and on the intestines. In speaking of whole wheat bread Osborne and Mendel feel that the foods usually eaten in an ordinary diet supplement the deficiencies of white bread better than the wheat embryo itself. Alvarez emphasizes the fact that "most (of the fibrous parts of fruits and vegetables) is quite indigestible and if we eat much of it we throw a heavy burden on the bowel," and F. H. Smith of the Mayo Clinic says, "The use of indigestible materials is not unattended with disadvantages." In England, Arthur F. Hurst writes, "Although the indiscriminate use of purgatives may have serious results their dangers have been exaggerated, and indeed it is doubtful whether more harm does not result, especially in children, from the excessively irritating diet sometimes recommended." And again, "An excessive quantity of coarse indigestible food probably does more damage to the mucous membrane than a mild chemical irritant." And McCance and Lawrence say that "children are very intolerant of high cellulose diets and, for some, brown bread is far too irritating," and "one should be cautious in advising whole meal bread generally." Dr. Frank Mann found that rough diet such as cereal increased the incidence of ulcer in (experimental) liver animals, and Whitacre, Willard and Blunt have determined that fiber interferes with the utilization of protein.

Professional dietitians may harp on the benefits of the coarse, roughage, vegetable, salad, fruit, nut and bran types of diet, but we physicians know that patients with sick digestive organs frequently need bland and soothing foods. But low-residue diets are not to be continued indefinitely; and for the restricted period we might properly provide a substitute non-irritant bulk-producing preparation, such as mineral oil or agar.

DRUGS

A great objection to the repeated or habitual use of laxatives in chronic constipation is that their action is unphysiological. They may increase tone beyond the normal and so unduly narrow the lumen of the colon and lessen its storage capacity. In the cecum and ascending colon they may change the normal retarding antiperistaltic waves into peristaltic ones, thus causing the liquid small intestine contents to rush through to the transverse colon; in the transverse and descending colon they may cause overactive peristalsis in place of the normally retarding haustration; and finally they may substitute continuous propulsive peristalsis throughout the colon for the normal occasional mass movements, and by passing the contents along in a continuous stream of liquid or mushy matter not only fill the distal colon with undigested and fermentable material but favor its passage on into the rectum to cause subjective sensations of a desire to defecate when defecation should not take place. If by correlation of retarding and propulsive mechanisms the normal colon produces one or two formed stools a day, it should be our endeavor in the constipated colon to produce the same effect and no more.

The drugs mostly employed, though not always wisely, for repeated administration in chronic constipation are: (1) softening and bulk-producing agents, (2) phenolphthalein, (3) the salines, (4) the tonic laxatives.

The *softening and bulk-producing agents* may be thought of as substitutes for dietary residues and liquid and are administered to produce bulk and a softer consistency of the colon contents. The ones that I value are mineral oil, small doses of magnesia, and agar. In those requiring a slight tonic action in addition the preparation I like is cascara-agar.

Even *mineral oil* is not totally harmless for by coating the particles of food with an unchangeable oil it retards their digestion, and as it is wholly unabsorbed it may carry out whatever is soluble in oil. Dutcher, Ely and Honeywell have suggested that this is the case with Vitamin A, and it is presumably true also for the other fat-soluble vita-

mins, D and E. On the other hand it may be useful by dissolving and carrying out some of the common poisons of putrefaction, notably indol and phenol. It frequently gives a peculiar sour odor to the stools which suggests something abnormal. Mineral oil shows its greatest usefulness in conditions of overirritability or hypertone and particularly is its softening power of value in anal irritations and rectal constipation and in those whose feces consist of conglomerates or hard masses. Preparations of agar and mineral oil together have become popular, but like all emulsions they are mostly water. In an investigation made for the American Medical Association it was demonstrated that none of them contains more than traces of agar and that they consist of from 35 to 55 per cent of water. Most of the manufacturers now furnish these preparations with the addition of magnesia, phenolphthalein, etc., rather a shotgun type of mixture.

Magnesium oxide and milk of magnesia in small doses are essentially softening and bulk-producing agents, for they carry water into the intestines and hold it there. (See below.)

Psyllium seeds, used considerably fifty or sixty years ago, given up and recently resurrected, are much like flaxseed and swell up in a watery medium to form a mucilaginous bulky mass. In some cases they serve well, but they form large mucilaginous fermenting stools or in some cases rubbery gelatinous stools. In almost all instances many of the seeds are found wholly unchanged and thus constitute roughage. Most of the psyllium takers who have come to me have been better off when the drug was stopped.

Phenolphthalein is a mild but continuous irritant which very readily results in unphysiological soft unformed stools. It is said to keep up its action by its absorption and re-excretion in the bile. It is a useful drug but its dosage should be kept as low as possible. The oil-agar-phenolphthalein preparations now much in use should be administered with circumspection, for they are a frequent cause of the undesirable substitution of loose bowels for constipation. Phenolphthalein may result in a pronounced rash.

SALINES

The action of salines is peculiar. Von Oettinger and Sollmann found that hypertonic solutions of magnesium sulphate started a wave at the top of the bowel which passed rapidly down ahead of the fluid and caused evacuation before the fluid containing the salt had gained the lower reaches of the bowel. Indeed, as the fluid itself came in contact with the peristaltic region it depressed and quieted the waves. This is in line with the observations of Cook, Slesinger and Hurst on a solution of sodium sulphate given with enough barium to enable them to follow it with the X-rays. There was a watery stool in 2½ hours though at 4 hours the barium had reached only the cecum. The first watery stools did not contain an excess of sodium sulphate and the greater part of the salt was passed the next day when the motions were solid. Best also demonstrated that in dogs with fistulas so arranged that the solution could not reach the large intestine, hypertonic mineral waters produced catharsis. That the action of salines is not due to absorption, however, has been shown by many observers. Alvarez has also noted that saline fluids can pass through many feet of small intestine without any apparent motivity of the bowel at all; and that frequently, as the fluid passes along, some of the solids are dropped by the wayside and left behind. Soper has found that magnesium sulphate by rectum is wholly sedative in its action.

In the usual *large cathartic doses* the salines may produce daily soft movements for a time, but they are imperfect cleansers, unduly activate the small intestine, which does not need activating, produce entirely abnormal movements of the bowels, and have no power to restore the colon to normal. They have their values but are not curative and should not be depended upon for any great length of time.

On the other hand *weak (hypotonic) solutions of salines* may have a different effect. As determined by Siaulis and Sollmann, hypotonic solutions of various salts, even diluted Locke's solution, increase the tone of the small intestine and the rate of the peristaltic waves. But *small amounts of the laxative salts,* most strikingly those of magnesium and the sulphate of sodium (Glauber's salt), retard the absorption of the water in which they are dissolved; so that instead of being absorbed and passed out by the kidneys the water may be carried through the small intestine to the large bowel, where it adds to the fluidity and

serves as a softening and bulk-producing agent. These actions give the explanation of the laxative effect of a teaspoonful of sodium bicarbonate, milk of magnesia or common salt taken with two to four glasses of water on an empty stomach. If taken at bedtime the action is slow, if taken on arising it may be rapid. This procedure may be a useful one at the outset in getting old constipated bowels started in a new habit, but it is not to be continued indefinitely. Daily doses of magnesium sulphate frequently give a sulphide odor to the stools.

THE TONIC LAXATIVES

Of drugs for chronic constipation when the hypertonic or hyperirritable state does not predominate, the tonic laxatives excel all others. They are cascara, senna, aloes or aloin, and rhubarb. Most observers note that their action is confined to the colon and that they will act even when introduced by enema. They are therefore ideal remedies from the colon point of view. Should these drugs lie in the bowel and fail to be expelled they do not cause inflammation, and their active principles when absorbed are eliminated without harm to the kidneys. As a rule, too, their dose does not need to be increased but may be gradually reduced. They may be given in a single dose at night, as an aloin, belladonna and strychnine pill, the aromatic syrup of rhubarb, a senna preparation, a cascara pill or the fluid extract of cascara. Many people chew a few senna leaves at bedtime or take some senna tea. Others chop up senna with dates, figs, prunes, etc., and take a teasponnful or two. If a drug of this class shows a griping tendency it may be that the constipation is predominantly due to a hypertonic condition of the colon, so if the griping is not overcome by the addition of belladonna the drug must be abandoned. Cascara is probably the worst offender of the group.

But *for cure rather than relief* a better method, though a more troublesome one to the patient, is to give these drugs in small doses throughout the day, with in addition, perhaps, a dose of mineral oil for softening purposes. Quite frequently we have had ten minims of cascara three times a day give better stools than a single dose of a dram or two at bedtime; and with tonic laxatives so administered we have seen satisfactory continuance of the movements though we progressively reduced the dose of the drug till finally it was dispensed with altogether.

It takes a long time to overcome chronic constipation and as the remedies must be continued for months they should be simple and the doses and the prescription modified from time to time. If the medicine must be continued throughout life the patient is not cured, however great may be his relief.

Many chronic neurotic patients take abundant laxatives and enemas because of a fear that if they do not have several liquid or soft movements every day they are headed for destruction. In some of them I find that a cascara-agar preparation in doses of one or two teaspoonfuls with or after the meals or a teaspoonful or two of milk of magnesia with two glasses of water at night or before breakfast will produce the normal soft formed stool and prove entirely satisfactory to the patient. But as these may not act for two or three days the patient must be warned and his coöperation secured. These patients need instruction and must be strongly impressed with the idea that liquid movements are injurious.

In the use of laxatives we have several rules:

Rule 1. Have the medicine taken every day and at the same time of day. P.R.N. administration never cures constipation.

Rule 2. Do not employ drastics. These drugs, jalap, podophvllum, scammony, colocynth, etc., can readily produce inflammation. In my laboratory days all that we had to do to demonstrate acute colitis and acute nephritis was to close off the rectum of a dog and administer a good dose of the compound extract of colocynth or the resin of jalap. I have seen death in a woman from the failure of the bowels to move in response to excessive doses of these drastics, and the autopsy revealed this same acute nephritis and colitis. Drastics are local irritants capable of producing inflammation, and chronic constipation is never cured by compound jalap powder or compound cathartic pills.

Rule 3. Use strong purges little, if at all.

Rule 4. Do not allow the feces to be liquid for any great length of time. A liquid consistency of the feces is most favorable to fermentation and putrefaction; in fact, the feces may be nothing but sewage. This is a fault that I have observed much in those taking the agar-oil-phenolphthalein preparations. Chronic constipation cannot

be successfully *cured* by replacing it with diarrhea.

Rule 5. Do not allow the feces to continue highly offensive. It means fermentation or putrefaction with all its accompanying ills. The nose is all the laboratory apparatus required to detect this. If the feces smell of the cesspool or like vinegar pickles there is something decidedly wrong.

Rule 6. Note the character of the stools. From time to time have the patient bring a full stool in a pint glass fruit jar. Patients will think more of a doctor who examines stools, and stools tell the doctor a lot about the patient. And they are no trouble, at least to the doctor, for the eye and the nose will in a moment's time furnish more valuable information than the laboratory.

Enemas. These may have to be employed occasionally, and indeed if atony of the rectum cannot be overcome they may be required throughout life. I have had two patients who have used a daily enema for some forty or fifty years. But enemas are not purely local in their effects and cannot be considered harmless.

In normal animals Cannon observed that the almost immediate result of a warm enema might be rapid waves of peristalsis in the small intestine with deep antiperistaltic waves in the large. They often continued running for long periods of time. The X-rays have demonstrated how a two-quart enema will regularly reach the cecum in 2 or 3 minutes, and how complete in most cases is the emptying of the whole colon at the subsequent defecation. Such complete emptying is far from physiological. The barium enemas also reveal the fact that enemas may pass into the small intestine. Alvarez reports some leak backwards in 60 per cent, and Dr. L. G. Cole has told me that it occurs in his X-ray department in about 20 per cent. Others say that such a leak can be produced in anyone if the enema is large enough. The extent of the backward leak depends not alone on ileocecal incompetence, but quite as much on the bulk of the enema and the extent to which antiperistalsis is set up in the ascending colon. Hannes observed that if cats and dogs were in the fasting condition an enema was always regurgitated, but never when they were well fed. In very sick humans I have seen enemas vomited, and this is of such frequent occurrence that most physicians have met with it, or at least heard of it in their locality.

I have thought that by accustoming the rectum to the stimulus of a large bulk repeated enemas would tend to lessen the rectal tone and sensitiveness, but Soper declares that in a majority of enema users he has found, not an atonic condition of the rectum and pelvic colon, but a hypertonic state. Such patients are also prone to show mild infections with congestive and granular changes in the mucosa. *The trouble is that the usual enema consists of soapsuds.* In six out of twenty men to whom a half per cent practically neutral soapsuds enema was administered by Runge and Hartmann, occult blood was found within three days; and in all of sixteen rabbits with the same soapsuds enema an examination of the intestine revealed ulcerations and diffuse ecchymoses. With the sigmoidoscope I have many times observed marked congestion after a soapsuds enema, but never such profound changes as these. Alvarez states that powerful contractions are produced when the colon is filled with soap water and then tied off a little above the anus. For ordinary purposes a plain water enema will suffice (with or without the addition of a teaspoonful or two of sodium bicarbonate or common salt).

Colon irrigations are not to be employed to move the bowels. Their use is to get out something higher up that is not expelled in the regular bowel movement.

Massage has been recommended with the idea that it would propel the colon contents and force the bowels to move. But, as we have noted, the colon contents are propelled normally by occasional mass movements. How then, as Soper remarks, can one select the right time to apply the massage? Furthermore it is surprising how tightly the haustra will grip the more solid contents of the left half of the colon. In cats and other animals it has been found difficult to move these along even with the abdomen opened, and in humans Alvarez noted with the fluoroscope that even in thin persons the fecal matter in the left colon was held so firmly that he was unable to push it along at all.

RÉSUMÉ

1. In the small intestines constipation is not ordinarily encountered except at the terminal ileum.

2. In interpreting X-ray pictures of the colon we must be guarded.

3. During most of the time the colon is markedly a retarding organ. Only at rare intervals does it act as a vigorous propulsive organ.

4. In rectal constipation the treatment is local, with perhaps a softening agent by mouth.

5. Large factors in the production of bowel movements are the character and amount of the ingesta, and in the simpler cases attention to these may be the sole requirement. In many cases the orange in the morning and the apple at night may have real value.

6. In most cases the best diet is one with a proper amount of roughage, but avoidance of excessive amounts of any one type of food.

7. Excessive salad, fruit and vegetable roughage at every meal is prone to generate irritative digestive disturbances.

8. Irritative states of stomach or bowels contraindicate the use of roughage, therefore in the presence of gastric hyperacidity, mucous colitis and other irritative conditions the need at the outset is bland food and appropriate drugs, among which are: the softening and bulk-producing agents, phenolphthalein, the saline laxatives in small doses with much water, and the tonic laxatives.

9. Enemas should not be used indiscriminately and for ordinary purposes should consist of plain water.

10. Massage has little if any value.

11. In constipation, because of its accompanying ills, the first requisite is that the bowels shall be made to move; therefore in those who cannot be cured a nightly laxative is desirable.

12. In atonic types strychnine and in hypertonic or vagotonic types atropine are valuable drugs.

In final review we might say that in nature, if the bowel is normal, bowel movements are dependent upon: 1, a sufficient bulk of food residues; 2, the ability to keep the residues from becoming unduly hard; 3, the power of the residues to produce normal reactions in the bowel wall either by their bulk, by their roughage content or by chemical drug substances contained in the foods or developed from them by digestive or bacterial action.

In the treatment of constipation it is our ultimate endeavor to bring the patient back to these normals. But when the constipation is associated with diseased digestive organs and especially if these show hypertone or hyperirritability, we substitute bulk producers for the roughage part of the food residues, insure softness by water and oil, and instead of depending for stimulation on complex foods which contain or yield indefinite amounts of uncertain chemical stimulants we prescribe definite doses of drugs whose action is known. And so we are physicians.

In closing I wish to acknowledge my especial indebtedness to three great contributors to the subject of constipation, namely, Walter B. Cannon, Arthur F. Hurst and W. C. Alvarez.

33 East 68th Street, New York City.

CORNS, HAMMER-TOES AND BUNIONS

J. G. R. MANWARING, M.D.†
FLINT, MICHIGAN

For some unknown reason these most common causes of painful feet have not received the attention from surgeons which they merit. It is largely left to the shoe salesmen, the druggist and the chiropodist to treat them and all they do is give temporary relief, but not a permanent cure.

In order that the sufferer may get around in partial comfort, constant care in the way of protection, medication, etc., must be given.

They are all due to the development of painful areas on the toes caused by the constant pressure of soft tissues between bony prominences in adjacent toes or between shoes and such prominences. Because of this prolonged pressure in these conditions, there is an irritation with the formation of calluses in the skin, subcutaneous bursal sacs in the soft parts and exostoses on the bones. These three conditions vary in degree but all are usually present in the most marked cases. When these overgrowths develop they still further increase the pressure and the pain. The painful callus may be removed by various means but will return so long as the pressure is not relieved. A permanent cure can be expected only when the bony part is removed.

For some years we have treated corns with increasing radical surgery until now, realizing that toes are of little use, we do not hesitate to even "bone" some of them. The patients will not submit to amputation, but will consent to lesser operations which change the looks of the feet but little.

A rubber stamp of the toes, such as in Figure 1, is convenient in making a record of the painful areas as determined by examination before operation.

Operations upon the feet for painful pressure are usually done with the use of a local anesthetic which is freely injected around the metatarsal head and base of the toe. The smaller bones need small instruments and are cut with bone forceps such as dentists use, of which two or three types should be available. Careful suturing with a non-absorbable material will aid in prompt healing. The operations are all done at one sitting though sometimes as many as four are necessary on each foot. The patients are kept off the feet for two weeks, when the sutures are removed and they may get up and around.

The aim of the various operations is to remove the pressure from the underlying enlarged bone, which may be done in a number of ways, as will occur to the surgeon when operating. Several typical operations are shown diagrammatically in the figures.

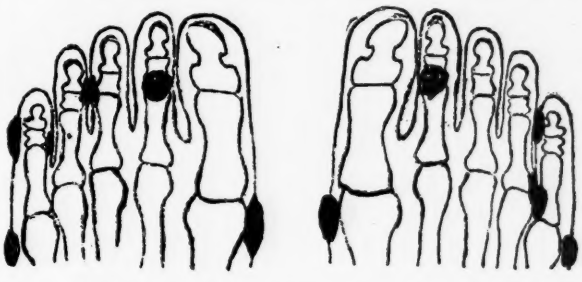


Fig. 1, showing how painful pressure spots are recorded with use of rubber stamp figure.

Figure 2 shows the simplest kind, a soft corn due to pressure by an enlarged joint. It may be on the same toe or the one adjacent or on both. In any case the operation is the same. First a flap is turned down over the joint and then a portion of the joint is removed, usually one-half of its diameter or more as indicated by the line "a" in Figure 2. The corn which is usually in the flap need not be removed, for it will disappear in time if freed sufficiently from pressure.

Figure 3 shows the usual hammer-toe, the pain of which is often quite disabling because of the pressure on its apex and only indirectly because of the cramped position of the toe. The standard operation given in some text-books is very satisfactory. A wedge is cut out of the upper half of the toe including the corn and joint beneath as shown by the dotted line "a." The soft structures are united by fine catgut bringing

†Dr. Manwaring is a graduate of the University of Michigan Medical Department in 1901. Served two years in University Hospital subsequently. Located in Flint in 1903. Practice is limited to surgery.

the bone ends together before the skin is closed. At the same sitting as a preliminary operation, a small tenotome is inserted and the dorsi-flexor tendon and anterior capsule of the joint are severed. The toe is held down by an adhesive strap over it and under the adjacent toes. After three weeks the shoe will keep it in place.

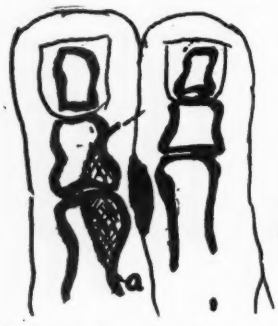


Fig. 2, soft corn and bone to be removed to cure it.

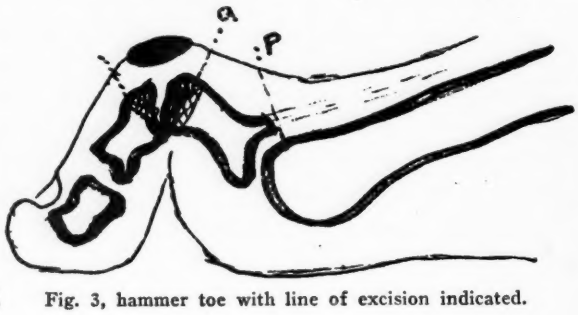


Fig. 3, hammer toe with line of excision indicated.

Around the little toe corns are most numerous and troublesome. The usual one is on the antero-lateral surface over the middle joint. The next most common occur as soft corns at the web between the fourth and fifth toes as a result of pressure made by an enlarged fourth metatarsal head which lies opposite the middle or proximal half of the first phalangeal bone of the small toe. Occasionally contact corns form from the pressure of the middle joint of the fourth toe. In addition, a very painful area develops at times over the outer surface of the fifth metatarsal head. This is similar to the ordinary bunion. These areas are indicated in Figure 4.

Where only one pressure spot is to be relieved, a flap may be turned down and the underlying bone resected liberally. For a soft corn, which is so common at the web, a vertical incision is made over the metatarsal head with excision of the exostosis which seems always to be present in such cases. This is shown by line "a" in Figure 4.

More frequently there is more than one area to be fixed so that the little toe is more commonly operated by removing all of the proximal phalangeal bone and the enlarged end of the middle one. This may be done by an elliptical incision which removes the outer corn. The bone between "c" and "d" as in Figure 4 is removed this way. When there is need for removing a button of bone from the fifth metatarsal head also, as shown by "b," an incision, as indicated by the dotted line in Figure 5, is used. This also removes the corn and the resultant toe is smaller and better looking afterwards.

Many operations have been devised for bunions but the popularity of the operation is not in proportion to the number of painful bunions. This may well be due to the fact that the operations done are not always successful, for the pain often persists and weak feet which ache after long use are common.

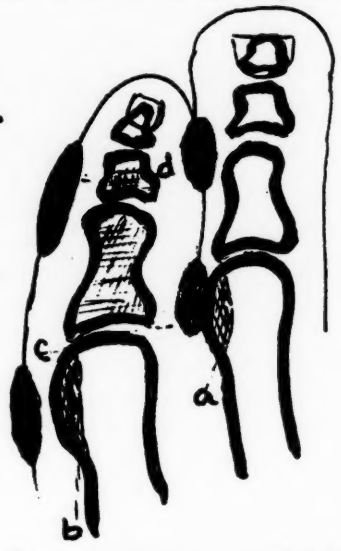


Fig. 4, lateral corns around little toe and bone resections to cure them.

Those operations which tamper so much with the metatarsal head should not be done. The sesamoid bones are an important part of the ball of the foot and should not be disturbed even when they seem too large. The abduction of the toe is not the direct cause of pain; this is due to the pressure over the metatarsal head.

It would seem that removal of the exostosis on the inner side of the metatarsal head would cure the condition, but relief is only temporary. Examination shows these toes to be longer than the rest and if straightened up they extend beyond them. In its abducted position, the great toe with its metatarsal bone forms an angle pointing inward and, because the toe is long, there is a constant backward pressure on its tip by stocking and shoe which tends to increase this angle and push the metatarso-phalangeal joint inward against the restraining shoe no matter how it is fitted. This is indicated by the arrows in Figure 6. When the exostosis is removed the pressure is reproduced by this mechanical arrangement and pain returns. An operation which

shortens the toe as well as removes the bony enlargement seems indicated to cure bunions permanently. Kellar's operation is founded on the right principles and since using it in a simplified form the results have been almost perfect from the point of relief and

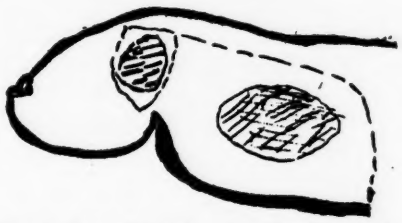


Fig. 5, line of incision for "boning" little toe and resecting exostosis of metatarsal head.

function. Such an operation would preclude toe-dancing, no doubt, but it answers for all ordinary purposes.

In this operation a generous flap is turned down, including in the flap the bursa and loose tissues down to the bone over the joint and the proximal end of the toe. The exostosis is cut off flush with the bone, avoiding of course the bearing surface beneath. The joint capsule is cut open and a narrow bladed knife is passed into the joint and over the end of the phalangeal bone between the tendons and the soft parts, freeing half its length on the upper and under surfaces, at all times hugging the bone closely.

The bone is then cut through at its middle with strong forceps and the proximal end freed from its attachments on the outer side and so removed. Too little can be taken away; it is not likely too much will be. The line of excision is shown in "a" Figure 6.

Any roughness is removed by a rongeur and the flap carefully sutured in place again. There is no need of interposing tissue so long as the cartilage covering the end of the metatarsal head is intact. The toe shortens up and while it has almost a flail joint it looks good and is painless.

In dressing the feet after operations, pads should be put between the toes and a large pad over all with a firm bandage to stop oozing. Hemorrhage of any moment seldom occurs.

As a result of this work the following opinions have been formed:

1. When operations are done for corns, bunions, etc., all should be operated. Corns of lesser degree if left will annoy with their pain.

2. Other painful conditions may need treatment also and may even make operation inadvisable as in gout and multiple arthritis. Plantar warts, flat anterior arches, hallux rigiditus, "ingrown" nails, mycotic infections must be looked for and

Fig. 6, amount of bone resected for moderately developed bunion. The drawing also shows how the length of the toe tends to produce a bunion.

cared for also. Hallux rigiditus though a part of a general arthritis is well treated by the bunion operation.

3. The toes are practically functionless in those who always wear shoes and efforts to save function should not interfere with sufficiently radical operations.

4. The plantar bearing surfaces must not be touched.

5. After operations the toes will go where the shoes make them. Over-corrections and the use of splints are not needed.

6. With firmly applied dressings drains are not needed.

7. Corns need not be removed if all the bony pressure is taken away. They may need trimming a few times but will eventually disappear.

8. Patients will not and often cannot afford to wear made-to-order shoes of ungainly shape. It is easier to change the bone pressure than the shoe pressure.

9. The loss of time is important and may at times be avoided by operating the feet when the patients are confined to bed for other operations.

10. The amount of suffering caused by pressure changes in the feet is great and should be eliminated more largely by proper surgery.

THE PRESENT STATUS OF RADIATION THERAPY IN PEDIATRICS

ERNST A. POHLE, M.D., Ph.D.†
and
HORACE K. TENNEY, M.D.‡
MADISON, WISCONSIN

In pediatrics there are a number of conditions amenable to treatment by roentgen rays or radium; there are quite a few in which the results must be considered doubtful. Many peculiarities, due to the fact that we are dealing with a growing organism, demand special consideration in establishing indications and contra-indications for radiation therapy, and also in outlining the therapeutic technique. Since the development of radiology has now reached a certain point of equilibrium, it may be worth while to discuss here the present status of radiation therapy in pediatrics.

Before entering the clinical phase of our subject, a brief introduction into the biophysical principles of radiation is necessary.* Roentgen rays and radium have a definite biological effect on living cells and organisms. According to Bergonié, young, growing and active cells, particularly if undergoing mitosis, are much more sensitive to radiation than adult and highly differentiated cells. Another theory, called the law of Arndt-Schultz, states that small doses of roentgen rays stimulate, medium doses inhibit the growth of cells, and large doses have a lethal effect. In spite of numerous experimental papers published on the subject of stimulating doses, no agreement has been reached, and we must say that, up to date, a true stimulative effect of roentgen rays or radium has not been proved. We are speaking, therefore, of small doses of roentgen rays or radium and must be aware of the fact that we deal in therapy mostly with doses that have either an inhibitory or a destructive effect.

For many years, we have believed that the skin of children is much more sensitive to radiation than that of adults. However, extensive and careful experiments, carried out by Schall[1] have shown convincingly that there is very little difference in the reaction of the skin of children and adults to exposure with the identical dose of roentgen rays. On the other hand, there is no doubt that the growing organism as a whole is more susceptible to radiation than the adult. A most important point is the relation between irradiated volume and total body volume. It is quite obvious that, for the same size of field of exposure, a higher percentage of the total body volume is being irradiated in a child as compared with an adult. The exact measurement of the dose becomes, therefore, imperative.

Since the International Congress on Radiology, held in Stockholm in July, 1928, has accepted the roentgen unit as the International unit in dosimetry, roentgenologists all over the world are enabled to compare their technic. While we do not wish to go into physical details regarding the definition of this unit, suffice it to say that in a number of laboratories in this country the determination of the r-unit and the calibration of measuring instruments in r-units can be carried out.[2] The Bureau of Standards in Washington, D. C., is also prepared now to calibrate ionization instruments in International r-units. The advantages of such a procedure are too obvious to require further explanation. In addition to this factor expressing the amount of radiation applied, the quality or penetration must be designated.[3] A convenient way to do this is the method proposed by Duane, who characterizes the quality of radiation by the effective wave length. These two factors, the effective wave length for quality and the r-unit for quantity[4] are used throughout this article.

†Dr. Ernst Albert Pohle, M.D. University of Frankfurt am Main, 1921; Ph.D. Michigan, 1928. Assistant Physiological Institute, University of Frankfurt, 1919-20; Resident, Department of Internal Medicine, City Hospital, Wiesbaden, 1920-21; Assistant in Institute for Radiation Research, University of Frankfurt, 1921-23; Roentgenologist, Mount Sinai Hospital, Cleveland, Ohio, 1923-25; Assistant Professor of Roentgenology, University of Michigan, 1925-27; Associate Professor of Roentgenology, 1927-28. Professor of Radiology, Wisconsin, 1927; Fellow of the American College of Radiology; Member American Roentgen-Ray Society, German Society Internal Medicine, Radiological Society of North America; Radiologist, Wisconsin General Hospital, 1927.

‡Dr. Horace Kent Tenney, Jr., M.D. Northwestern, 1919; Interne, Evanston Hospital, 1919-20; Postgraduate work in Pediatrics, Michael Reese Hospital and Children's Memorial Hospital, Chicago; Instructor, Clinical Medicine, Wisconsin, 1920-25; Associate in Pediatrics, 1925-26; Assistant Professor of Pediatrics, 1926; Associate Pediatrician, Wisconsin General Hospital, 1925.

*For details see a series of articles by E. A. Pohle in the Wisconsin Medical Journal, beginning January, 1930.

From the clinical point of view, the diseases of children which may be benefited by roentgen rays or radium will be discussed under the following headings:

A. GLANDS OF INTERNAL SECRETION

*Thymus.** The rôle played by this organ in disturbances in infancy and childhood is still far from being a solved problem. In some cases there is, undoubtedly, a relation between the size of the organ as determined by the roentgenogram and the clinical symptoms. On the other hand, similar symptoms may be present while the thymic shadow does not exceed the so-called normal limits. This demonstrates that the clinical and roentgen ray findings must be coordinated in making a diagnosis of thymic disturbance. An interesting suggestion has recently been given by Aldrich,[5] who observed that many clinical manifestations which were relieved by X-ray treatment of the thymus were disturbances of smooth muscle balance. If this is substantiated, the number of alarming symptoms met with in infancy which may be relieved by thymus exposure can perhaps be greatly enlarged. At the present time, the following symptoms form, in our opinion, an indication for irradiation of the thymus: (1) Stridor, (2) intermittent cyanosis not due to congenital heart disease, (3) pylorospasm. We do not believe that every enlarged thymus which is discovered incidentally when taking a roentgenogram of the chest in a child should be treated in the absence of clinical symptoms. If the patient is to undergo an operation, we urge, however, roentgen examination of the chest in all suspicious cases, followed by preoperative irradiation of the upper mediastinum, if thymic enlargement has been diagnosed. The ideal would be to examine the chest of every child by roentgen rays before undergoing any surgical procedure.[6]

The majority of radiologists use roentgen rays in the treatment of enlarged thymus; some prefer radium because it is not necessary to fix the child on the table. The radium preparation is placed over the upper chest and, therefore, the excitement always connected with the roentgen exposure may be avoided. Following the treatment of the thymus by either roentgen rays or radium, toxemia has been observed resulting in death in some rare instances. No explanation can be offered so far for these fatalities.

Inasmuch as the thymus is rather radiosensitive, a small dose of roentgen rays is sufficient; 30 r to 75 r as single dose (lambda effective equal to .32 to .21 Angstroms) are administered. That type of radiation may be produced by potentials from 100 K.V. to 130 K.V., filtered through 4.0 mm. Al or .25 mm. Cu. The dose can be repeated two or three times without any ill effects in the average case; no skin reaction should occur. Careful clinical observation and repeated roentgenograms must serve as guides in the determination of the required treatment. The absolute rule is to apply the minimum dose necessary to obtain the desired result.

Thyroid. The treatment of toxic goiter does not differ from that in adults. In view of the high mortality of surgery in hyperthyroidism in children, conservative treatment by X-rays should be given a trial first. The objection that this will lead to considerable fibrosis rendering a future operation difficult is not true if radiation treatment has been properly given; many leading surgeons have concurred in this opinion.

Most clinics prefer the use of small doses of roentgen rays in the treatment of toxic goiter. The general condition of the patient, the B M R, pulse rate and weight should be observed, and form the basis for outlining the therapeutic plan. Seventy-five r to 150 r over each lobe, sometimes the same dose over the thymus, are considered usually safe. This treatment may be repeated within two to five days, always carefully studying the reaction of the patient. The quality of radiation is the same as in thymus cases; so called deep therapy has no advantage over roentgen rays of moderate penetration in treating toxic goiter.

Hypophysis. There are not enough cases on record to permit a definite opinion as to the efficacy of roentgen therapy in the disturbance of the hypophysis. If irradiation is being attempted, the greatest caution and a very careful dosage are essential.

Suprarenals. Irradiation of the suprarenals can not be recommended.

Gonads. There is only rare occasion for treating the generative organs in children. Whenever it is indicated, the same rules as in adults apply.

B. TUBERCULOSIS

Pulmonary Tuberculosis. In adults, the

*A group of papers on this subject will be found in the March issue, Amer. Jour. Roent. & Rad. Ther., 1929.

fibrous type of pulmonary tuberculosis has been treated by small doses of roentgen rays. This requires an elaborate control of the individual patient in order to avoid ill effects. Considering the fact that the usual management of tuberculosis of the lungs brings about satisfactory results, the general use of roentgen therapy is not advocated in children. Furthermore, the fibrous type of pulmonary tuberculosis is rare in childhood.

Glands. Tuberculous involvement of the cervical glands has been treated successfully by roentgen rays in a considerable number of cases, both in the suppurative and pre-suppurative stages. Sometimes a small incision or aspiration of the pus is sufficient which does not disfigure the neck as an open drainage. Tracheobronchial and abdominal tuberculosis respond better to ultra-violet radiation. In surgical tuberculosis, local roentgen therapy may be used in supplementing the general treatment of the patient. Good results have been reported from Perthe's clinic in Tubingen.[7]

The single dose applied to the involved glands is in the neighborhood of 50 r to 150 r. Roentgen rays of moderate penetration are recommended. Treatment may be repeated two or three times at intervals of three to ten days. A new series should not be started before four to six weeks have elapsed after the first course of treatment. Heavy doses are contraindicated because of the increased danger of late reactions. Otherwise the results are gratifying in about 50 to 70 per cent of the cases.[8] For details regarding the technic in surgical tuberculosis, we refer to the article by Jungling.[7]

C. BLOOD DISEASES

Leukemia. In acute myelogenous or lymphatic leukemia, no form of roentgen or radium therapy offers much hope. Many radiologists do not advise it because the fatal outcome seems to be hastened by irradiation. The chronic forms of leukemia are treated according to the same principles as in adults; they are rare in children.

In chronic types of leukemia, we recommend the application of moderate doses of roentgen rays and radium. The attention of the therapist should not center on the reduction of the high blood count to the normal level, because this is usually possible if a high enough dose is given. However, the white count is only one factor in this incurable disease and we should remember that in the late stage the susceptibility to radiation decreases considerably.[9] Moderate doses should be given, therefore, in the beginning and high doses saved for the end stage. As the symptomatic improvement of the patient means so much in such a chronic affection, the general condition of the patient should be an important factor in the determination of the therapeutic procedure. The enlarged spleen is treated first, and in lymphatic leukemia the involved glands, then the long bones, spine and sternum. Frequent blood counts are essential. A drop in the hemoglobin should caution against further irradiation. The B M R may also be followed up.[10] Roentgen rays of moderate penetration are recommended. The single dose varies from 100 r to 200 r. The intervals between treatment should be as long as the condition of the patient remains satisfactory. Routine treatments at definite intervals without considering the merits of the individual case are not advisable.

Hodgkin's Disease. This is by no means a rare condition in childhood. While it is usually fatal, roentgen rays offer the best chance for temporary relief. The technic of the treatment is essentially the same as in leukemia.

D. SKIN DISEASES

The most important application of irradiation in skin diseases in children is in cases of nevi. While not all types respond well, an early attempt with radium is worth while in the majority of cases. No definite doses can be given because they have to be varied according to the requirements of the individual patient. As a rule, if one or two applications of light filtered radium do not produce any results, gamma radiation at two to three centimeters distance is indicated. Although a few clinicians recommend high doses, the majority agree that any skin erythema should be avoided. There is too much danger concerning the development of a late reaction. We can only emphasize this conservative attitude.

E. INFLAMMATORY CONDITIONS

The X-ray treatment of inflammatory conditions was inaugurated by Heidenhain,[11] in 1915. On May 1, 1929, his statistics comprised fifteen hundred treated cases with an average of 75 per cent good results.[12] While his list includes a good many inflammatory processes, the condition which has been most frequently and successfully treated in children is acute cervical lymphadenitis.[13, 14] Our own experience in a

limited number of cases is bearing out the conclusions of other investigators.

In the treatment of inflammatory conditions, the principal point is the use of small doses of roentgen rays; 30 r to 75 r are sufficient. The penetration of radiation is of minor importance; 100 K.V. filtered through 4 mm. Al. or 200 K.V. filtered through 1.0 mm. Cu. will have the same clinical effect, assuming equal doses. Quite often it is necessary to repeat the first dose two or three times; provided proper technic is used, there is, of course, no danger of skin reaction.

Under this heading, we mention also the work of Bordier,[15] who treated cases of poliomyelitis anterior successfully by roentgen rays. Recently the beneficial effect of roentgen rays in pertussis has been brought out again.[16] In such a variable condition as pertussis, it is difficult to evaluate with accuracy the effect of any therapeutic measure.

CONCLUSIONS

1. The biophysical principles of radiation therapy as related to pediatrics are briefly discussed.

2. The more important conditions in children amenable to roentgen or radium therapy are outlined and the technic is given as far as feasible.

3. Accurate measurement of the dose and a conservative attitude in the administration of roentgen rays or radium in children is urged.

BIBLIOGRAPHY

1. Schall, L.: Fortschr. a. d. Geb. d. Roentgenstrahlen, 1924, XXXII, 1. Kongressheft, p. 85.
2. Pohle, E. A.: Amer. Jour. Roent. & Rad. Ther., 1927, XVII, 104; XVIII, 55.
3. Pohle, E. A. and Barnes, J. M.: Radiology, 1928, X, 300.
4. Hickey, P. M., and Pohle, E. A.: Radiology, 1929, XII, 309.
5. Aldrich, C. A.: Amer. Jour. Diseases of Children, 1929, XXXVII, 1346.
6. Pohle, E. A.: Jour. Mich. State Med. Soc., 1927, XXVI, 559.
7. Jungling, D.: Lehrbuch d. Strahlentherapie, II, 353, Berlin, 1925.
8. Eghiyan, A., and Wyes, E.: Rev. med. d. la Swisse, 1928, XLVIII, 721.
9. Leddy, E. T.; Amer. Jour. Roent. and Rad. Ther., 1929, XXI, 250.
10. Krantz, C. T., and Biddle, M. C.; Amer. Jour. Med. Sciences, 1928, CLXXV, 229.
11. Heidenhain, L.: Strahlentherapie, 1927, XXIV, 37.
12. Fried, C.: Strahlentherapie, 1927, XXVI, 484.
13. Rosenberg, L. C.: Amer. Jour. Diseases of Children, 1929, XXXVII, 529.
14. Viethen, A.: Jahrb. f. Kinderheilkde., 1928, CXXII, 284.
15. Bordier, E.: Jour. de Radiologie, 1923, VII, 544.
16. Samuels, E. C.: Southern Med. Jour., 1929, XXII, 548.
17. Lehrbuch d. Strahlentherapie, III, 713, Berlin, 1926.

THE TREATMENT OF THE OCCIPUT POSTERIOR POSITION

M. EDWARD DAVIS, S.B., M.D., F.A.C.S.†

CHICAGO, ILLINOIS

The occiput posterior position has always been a problem for thought to obstetricians, and its proper management often taxes the best obstetrical skill. The following is a brief outline of the general course of treatment adopted at the Chicago Lying-in Hospital.

A complete prenatal examination of the pelvis is most essential in the intelligent management of any obstetric case, but is more important when the patient presents herself with an occiput posterior position at the onset of labor. If there has been some thought of the advisability of delivery from above because of the lack of room in the pelvis, the occiput posterior position may be the deciding factor. This is particularly true of that group of cases which we class under the general term of "Dystrophia Dystocia Syndrome" or "Endocrinopaths." In brief, the more common features of this class are: slightly justo minor or masculine type pelvis; signs of hypopituitarism, undeveloped cervix and vagina; aged primiparity; prolonged pregnancy; overmaturity of the child; premature rupture of the membranes; protracted labor; poor pains; and occiput posterior positions. Given a patient belonging to this class, where the disproportion between the baby and the pelvis seems too great, one should not hesitate to decide on a low cervical cesarean. Occasionally a test of labor may be necessary to convince the obstetrician that the obstacles to be overcome in a successful delivery from below are too great or impossible.

The vast majority—95 per cent—of women who enter into labor with an occiput posterior position will deliver spontaneously or with the aid of a simple forceps operation if they be given sufficient time. The course of labor is usually slow and painful, demanding the utmost care and patience on the

†Dr. Davis graduated from Rush Medical College in 1922. B.S. degree from the University of Chicago. He interned at the Los Angeles General Hospital and was Resident Obstetrician to the Chicago Lying-In Hospital for two years. He is now Assistant Professor of Obstetrics and Gynecology at the University of Chicago. He is a Fellow of the American College of Surgeons and a member of the Chicago Gynecological Society. His practice is limited to Obstetrics and Gynecology.

part of the attendant and the patient. This means careful observation throughout the long hours of the labor, sustaining the patient with food readily digestible, the pushing of fluids and providing of rest when necessary. During the first stage we do not hesitate to give the patient 1/6 to 1/4 grain of morphine sulphate combined with 2 c.c. of 50 per cent magnesium sulphate solution intramuscularly. The magnesium sulphate may be repeated once or twice at 20 minute intervals. If this form of analgesia is given when the cervix is completely effaced and dilated to 3 or 4 centimeters, the patient will rest for four or five hours, awaken much refreshed and continue her labor satisfactorily. Very often one is surprised to find that considerable progress has been made during the hours that the patient has been dozing and several hours of good strong pains bring the case to a favorable end. If the labor be exceedingly lengthy and long-drawn-out, we make use of a rectal instillation as described by Gwathmey.

Slow dilatation of the cervix is characteristic of this condition. Occasionally after the effect of the analgesia has worn off, the pains return slowly and inadequately. It may be necessary to stimulate the uterus. A hot enema followed by 3 to 5 grains of quinine with or without the castor oil may be sufficient. Of late we have been using intranasal pituitrin as described by Hofbauer. This, however, is not a harmless procedure as we have noted vigorous tetanic pains following its use. One should be prepared to remove the cotton saturated with the pituitrin if occasion demands.

It may be necessary to resort to mechanical means to complete dilatation. We make use of the Voorhees bag, the size depending on the extent of the dilatation. If the cervix is only sufficiently dilated to admit one or two fingers, a 7 to 9 cm. bag is preferable; if dilated to 4 or 5 centimeters, we use a 9 to 11 cm. bag. The smaller bag is more successful in bringing on good pains in a short time, but has the disadvantage of not completely dilating the cervix. The larger bag, due to its size, often lends to the inertia of the uterus by overstretching the lower uterine segment. Metreurysis always adds slightly to the danger of infection, displaces the head somewhat (more so in case of the larger bags) and occasionally results in a prolapse of the cord. By careful management and technic, these disadvantages may be minimized.

Rapid delivery may be demanded because of the condition of the mother or the baby. Should the cervix be completely effaced and dilated to 7 or 8 centimeters, Dührssen's incisions may be used to obtain complete dilatation.

The bag of waters, which should be kept intact, if possible, until complete dilatation has been secured, can now be ruptured and the patient allowed to make use of her bearing down efforts; often rotation of the occiput will take place after the head has reached the perineum. Progress finally comes to a standstill and nothing more can be accomplished by the patient's own efforts.

If the head is not engaged after complete dilatation, version and extraction may be the operation of choice. High forceps are dangerous for the baby and mother and have almost been abolished in our clinic. Occasionally one may successfully complete a high forceps operation in a multipara after the head has been rotated manually or with the aid of the forceps. If rotation has been completed, it is permissible to make gentle traction but if there is no progress it is far better not to persist and to deliver the baby by version and extraction.

If the head is engaged, the following is our method of treatment: At first an attempt is made to rotate the head manually. This method is successful in at least 90 per cent of cases, and the more experience one has with it the less likelihood there is of failure. It is the least harmful of all the methods described because one cannot damage baby or mother, and in the event of failure another method may be tried. The objections to it are that the head is sometimes displaced from the pelvis and occasionally the cord may prolapse. As to the first, our experience has shown that it makes little difference how far up the head is pushed to effect rotation, because once rotation is completed, the head descends into the pelvis in its new and more favorable position. It can easily be pushed down with the hand above the pubis or pulled down by gentle traction. Very often we push a head completely out of the pelvis to complete rotation with the aid of rotating the shoulders, but the head which has once been moulded in the pelvis slips back into it very easily. Prolapse of the cord rarely occurs in our

experience if the manipulations are carefully done. However, should this accident occur, the delivery may have to be completed by version and extraction.

With the patient under deep anesthesia, the perineum and vagina are carefully ironed out with the aid of plenty of green soap. This ironing-out process should extend around the entire head in the upper recesses of the vagina so that the head is made extremely mobile. In a primiparous woman it is usually necessary to do a deep mediolateral episiotomy so that the whole hand can be inserted. Either hand may be used for the rotation although some operators prefer to use the right hand when the occiput points to the left, and vice versa. The head is firmly grasped by the hand, dislodged gently from its bed, and the occiput rotated towards the side of the back, in left posteriors to the left. If possible, the rotation is continued until the occiput comes to lie under the symphysis. The left blade of the forceps is applied before the hand is removed. The internal hand is aided by the external hand, which pushes against the forehead from above the pubis or aids the back anteriorly.

In most cases the difficulty lies not in effecting rotation but in holding the head in position until the forceps are applied. This can be avoided by applying the left blade in left rotations before the hand is removed and by having an assistant press this blade firmly against the head while the right blade is applied. In right positions one may apply the right blade first while the hand is steadying the head, then apply the left blade and swing the handle underneath the first for locking. Pushing against the forehead from above the pubis will steady the head. In cases where the head rotates back very easily, the operator may also rotate the child's back to the front and then steady the back. Lastly, after rotation of the head is complete, the head may be held stationary with an Allis forceps affixed to the scalp until the blades are applied.

One may fail to secure complete anterior rotation manually and yet be able to rotate the occiput to the transverse or beyond it. This act accomplishes considerable, and complete rotation may be secured with the aid of the forceps. The "key-and-lock" maneuver of DeLee, to be described, is particularly easy when the occiput has been rotated to the transverse or beyond it.

In our clinic at the Chicago Lying-In Hospital we rarely use Kielland or other special forceps. The ordinary Simpson blades modified by DeLee are the only forceps popular. The shank of the Simpson forceps has been lengthened to about eight centimeters, creating an instrument useful in almost any type of operation. The forceps operation in occiput transverse and posterior positions, which I shall briefly describe and present in moving pictures, has been developed by DeLee and described as the "key-in-lock" maneuver for want of a better term.

With the occiput posterior in the right oblique, the forceps are applied in the transverse of the pelvis. This grasps the head in an unfavorable diagonal manner and all motions must be made very gently. With the slightest possible compression the head is now pushed up about two centimeters in the axis of the birth canal and gently twisted so that the small frontanel is rotated no more than five degrees. The head is then pulled down a little in the axis of the pelvis. These motions are repeated several times until the occiput comes to lie in the transverse plane of the pelvis. Now the blades are gently adjusted without being removed so they, too, come to lie in the transverse plane and fit the sides of the head. The gentle maneuvers consisting of a combination push, twist, and pull motion are repeated. As the occiput travels anteriorly, the blades are gradually readjusted so they fit the sides of the head securely. Four or five readjustments of the blades may be necessary until finally the occiput comes to lie under the symphysis and the forceps applied directly to the sides of the head. Now and not before this moderate traction may be made and the head delivered. Mediolateral episiotomy is the rule in primiparæ.

Occasionally it is impossible to effect rotation manually or with the aid of the forceps, and then it becomes necessary to deliver the baby as an occiput posterior. The forceps are applied in the usual manner, and the head is delivered very slowly, acute flexion being maintained at all times to present the most favorable diameters to the pelvis. A very deep episiotomy should be the rule because extensive damage to the perineum and sphincter muscle may result.

EPISIOTOMY*

J. CAMPBELL SMITH, M.D.†
DETROIT, MICHIGAN

My purpose in bringing this subject up for consideration and discussion is three-fold.—namely: 1, to attempt to refute the arguments of those opposed to the operation, and to point out substantial anatomical reasons, if no others, why it should be done almost routinely in primipara, and in multipara who have had a previous episiotomy; 2, to offer a simple, rational method of repair in the hope that it may be more or less standardized; and 3, to change, if possible, the existing idea of the *most important* (if not the sole) indication for its employment,—namely, to prevent perineal laceration.

The operation is not a new one, for we find mention of Ould, in 1742, cutting the vulvar outlet when it offered too great resistance to the escape of the head. G. P. Michaelis, in 1810, incised the perineum to avoid a dangerous tear. Ritgen and Schultze made numerous small incisions in the tense vulvar ring to facilitate delivery and to avoid perineal damage. Scanzoni recommended two lateral incisions, Credé, one, directed from the frenulum toward the tuberosity. Dührssen, in 1888, recommended a deep mediolateral episiotomy or perineotomy for pathological cases, in which the incision was carried through the levator ani into the ischio-rectal fossa.

Almost every primipara, with scarcely an exception, suffers some damage to her pelvic floor at the time of delivery, and in many cases this damage is not evidenced at the time, inasmuch as the rupture occurs in the underlying structures, and only reveals itself in the form of cystocele, rectocele, prolapse, etc., some several weeks later, giving rise to the many frequent serious symptoms and complaints all gynecologists are so familiar with. When one recalls the anatomy of the pelvis and the pelvic floor, it is quite obvious why these conditions arise, and I believe it would be time well spent to pause for a few moments to consider the anatomy of the pelvic floor—not in detail, for the scope of this paper will not permit that, but only the more important structures so vitally affected by childbirth, namely, the muscular and fasciæ systems.

THE MUSCULAR SYSTEM

The levator ani muscle, making up the bulk of the pelvic floor, arises from the back of the rami of the pubes, and is attached to the fascia covering the obturator internus muscle underneath a tendinous duplication of the superior levator fascia, called the "white line." The extent of the origin varies; usually it does not reach the spine of the ischium, to which the ischio-coccygeus is attached. Sometimes the two muscles fuse at their origins. The levator fibers pass downward and inward toward the median line. Posteriorly they come together on the lower end of the sacrum and coccyx; anterior to this they interlace in the median line behind the anus; next they fuse into a sling-like hammock under the perineal curve of the rectum, many of the medial fibers fusing with the sphincter ani and the lower part of the rectum. Different portions of this muscle are often given special names, thus: the ischio-coccygeus, running from the ischial spine to the coccyx; the ileo-coccygeus, running from the white line to the raphé; the pubo-coccygeus, from the posterior surface of the pubis to the raphé extending from the tip of the coccyx toward the rectum; the pubo-rectalis, from the pubis around the lower part of the rectum, sling-like.

For further consideration we may merely mention the sphincter cunni, ischio-cavernosi, and the superficial transverse perinei muscles. For the most part these muscles are rudimentary, and yet serve rather important functions. They center at a point between the rectum and vagina called the centrum tendineum perinei or perineal body. Also, the sphincter ani externus, attached posteriorly to the coccyx and anteriorly to the centrum tendineum.

*Read before the section on Gynecology and Obstetrics, 109th Annual Meeting of the Michigan State Medical Society, Jackson, Michigan, Sept. 19, 1929.

†Dr. Smith is a graduate of the Detroit College of Medicine and Surgery, 1925. Prior to that time he attended Western Reserve University for three years of pre-medical work. After graduation from the Detroit College of Medicine and Surgery he interned for three years at Harper Hospital, Detroit, following Obstetrics and Gynecology. An additional year was then spent in the Obstetrical division as resident at Herman Kiefer Hospital. His practice is limited to Obstetrics and Gynecology.

THE FASCIAE SYSTEM

The endo-abdominal fascia passes down over the brim of the pelvis and soon splits into two layers. One covers the obturator internus muscle, and one goes beneath it. One half way down the obturator internus the fascia thickens into a ridge, called the arcus tendineus musculi levatoris ani (or "white line"). Here the fascia splits, one layer passing downward on top of the levator ani and one layer continuing underneath it. Just below the white line the superior levator fascia thickens into another ridge, in which are found the hypogastric vessels, ureters, and the fibers of the bases of the broad ligaments. From its inner border four layers of fascia arise; one, very thin, goes anterior to the bladder; the second between bladder and vagina; the third between vagina and rectum, and the fourth retrorectal. The root stock of these four layers forms the base of the broad ligament. Anteriorly it is continued to the pubis to form the pubovesical ligaments; posteriorly to the sacrum to form the utero-sacral ligaments, and laterally it makes the bases of the broad ligaments. One might liken this to a wire wheel, the cervix being the hub and the radiating ligaments the wire spokes; if any of the spokes are broken or stretched, the hub will be displaced, resulting in disorganization of the entire system.

The superior levator fascia now continues and covers the free edge of the levator ani muscle uniting with the deep layer of the fascia of the urogenital septum. The fascia passes across from one pillar of the levator ani to the one of the opposite side between the rectum and vagina, fusing with the third layer of the visceral fascia above described. It is somewhat thicker here and holds the two pillars of the levator close together De Lee has called this portion the "intercolumnar fascia" of the perineum, since it is so very important in the mechanism of labor and in the repair of the pelvic floor lacerations and incisions.

These fascial and muscular planes and seams are of supreme importance in holding the cervix, bladder, vagina, and rectum in their proper relation to each other and to the pelvis. When they are torn or stretched, they allow the pelvic organs to descend in toto, or to be displaced one on the other.

An episiotomy, if done at the proper time, and repaired anatomically and with care, in the vast majority of instances (and I might almost safely say in *all* instances) will prevent not only the usual *external* perineal rupture, but also the far more serious tearing and stretching of the underlying muscle and fascia, giving rise, as mentioned above, to cystocele, rectocele, prolapse, etc. As practiced in former years, and in the vast majority of hands today, the one purpose of an episiotomy was to prevent *external* perineal lacerations, or to direct the already existing slight external tear away from important structures, such as the anus and rectum. It is my contention that this is the *least* important of *all* the indications, and episiotomy should be done routinely (with very few exceptions) on all primipara and on multipara who have had a previous episiotomy. Prevention of damage to the underlying muscles and fascia should be our primary thought.

Now as to the type of operation. There are three types mentioned: (1) the lateral or bilateral, where the cut is made in the horizontal plane; (2) the median, where the line of incision lies in the raphé (recommended by Pomeroy and Henkel); and (3) the medio-lateral, as recommended by Tarnier and De Lee. The first, or lateral, episiotomy was one of the earliest and is now practically obsolete, as it is readily seen that it does not enlarge the outlet to any great extent and thus cannot prevent the fetal parts from damaging the pelvic floor. The second, or median, episiotomy has two serious objections: it is obvious that an extension of the incision could very readily injure or penetrate the anal sphincter or rectum; also, assuming that this does not occur, the rectal wall lies directly beneath the line of incision and in the repair it would be very easy to perforate the rectum, thus increasing the danger of infection. The one objection to the third, or medio-lateral, is that there is usually considerably more pain and distress to the patient in the early postpartum days, and this may last for three or four weeks.

The usual medio-lateral episiotomy simply cuts the skin, urogenital septum, the constrictor cunni and transversus perinei muscles, the intercolumnar fascia, and a few of the anterior fibers of the pubo-rectal portion of the levator ani. Deeper episiotomies or perineotomies may be done as necessary, extending through the levator ani into the ischio-rectal fossa. The incision is usually

made to the left side, for convenience in repair. It is our custom to wait until the head (presenting part) is crowning to the extent of three to four centimeters, when it will be noticed that the anus has opened somewhat and has been displaced downward and forward. One blade of the scissors is placed on the vaginal mucous membrane, the other on the skin of the perineal body, midway between the anus and the tuberosity of the ischium, the cutting angle being at the raphé. Under anesthesia (general, spinal, or local) all of the intervening tissues are incised by a single closure of the blades. Hemorrhage, if any, usually ceases after delivery of the fetus.

It is best to wait until after the completion of the third stage of labor before starting the repair, but it is the usual custom for us to repair the episiotomy while waiting for the placenta to separate. This is not a good practice, however, for occasionally the placenta may be large enough to cause damage to the wound repair, and also it may be necessary to extract the placenta manually, in which case the repair would most certainly suffer.

We now have a straight, clean incision and can easily replace all structures in their correct anatomic relations. W. J. Blevins of Woodland, California, in February, 1929, issue of the American Journal of Obstetrics and Gynecology, has a few refinements in the technic of his episiotomy repair which I like very much. It differs only very slightly from the repair I have always done, and yet I feel the variations are sufficient to warrant my adopting his method, which is as follows:

"1. Begin the catgut suture at the angle of the incision in the vagina, the bite including the submucous tissue only. Tie a knot underneath and use a continuous suture, taking great care not to puncture the mucous membrane. When the vaginal wound is closed with proper approximation of the tissues at the vaginal orifice, direct the suture down to the muscular tissue in the wound. Apply a clamp to the free end of the suture and leave it long enough to tie to the suture used to close the muscular layer.

"2. Enter the crown suture beneath the fascia, passing upward and through it to the skin at the edge of the wound. By deep bites gather up the fibers of the constrictor cunnis and of the urogenital septum, the suture approximating the corresponding structures on either side of the wound, but not puncturing the vaginal wall. The ends of this suture are clamped and laid aside until the muscle suture is completed and tied. Then it is tied and cut closely, the knot being later covered with fascia.

"3. The index finger of the left hand should be in the rectum to determine the depth of the next suture. The deep suture should be started at the lower end of the wound. Tie the knot, leaving a long end to unite with the fascial suture. This should be a continuous suture, taking all of the severed tissues below the fascia, and going close to the rectal mucosa. When this suture is made tense, it approximates all the muscular tissues. It should be tied to the long end of the vaginal suture and the ends cut closely.

"4. The suture closing the fascia should begin at the upper end of the incision, starting under the fascia. It is brought through and over the fascia to the other side with the point of exit under the fascia near the point of entry and tied, drawing the fascia over the knot. This suture is continuous to the lower end of the wound. The end brought out beneath the fascia is tied to the muscle suture with the knot cut close. Thus we have mucous membrane, muscles, and fascia closed deeply, covering all sutures and knots.

"5. The skin is closed with subcutaneous silkworm gut, the point of entrance being about one inch from the side of the wound, running to the lower end of the wound and making a subcutaneous suture to the vaginal orifice, then running beneath the skin to a point of exit about one inch upward and to the side of the vulva. The suture is pulled tight, approximating the skin. A shot is put on each end about three-fourths of an inch from the skin. Thus the wound is closed with but two stitch holes in the skin and those are out of the line of vaginal discharge, thereby minimizing the probability of infection.

"The wound should be healed in ten days, and there is but a single subcutaneous suture to remove. In six weeks all tissues will be as firmly united as before labor began."

The argument has been advanced that episiotomy wounds are very prone to become infected and break down. To be sure, this type of repair requires considerable attention to technic, together with the strict

surgical asepsis. It is agreed by most men that there has been usually some error in technic when a poor result is obtained, or when an infection and slough occurs. Many men who are opposed to this operation claim that it is entirely unnecessary, stating that the pelvic floors of the women they deliver are not damaged, if proper care and deliberation is used at the time of delivery. The anatomical arrangement of the fascia and muscles is such that the birth of a large object such as a term fetal head cannot help but tear or stretch the same and in many cases cause a complete rupture; this is readily shown postpartum by a gaping outlet and usually cyctocele or rectocele or both.

An episiotomy done at the proper time and correctly and anatomically repaired will prevent the above mentioned ruptures and will leave a pelvic floor scarcely recognizable as one over which a fetus has passed.

In conclusion I cannot recommend too strongly the use of episiotomy routinely in all primipara and it must follow in all succeeding deliveries.

THE DIAGNOSIS OF ECTOPIC PREGNANCY*

JAMES M. PIERCE, M.D.†
Assistant Professor of Obstetrics and Gynecology, University of Michigan
ANN ARBOR, MICHIGAN

Although extra-uterine pregnancy is not a rare condition the diagnosis is frequently missed. This is due first to the fact that so few cases present the typical picture drawn in the text-books and secondly to the fact that no one test or symptom makes the diagnosis sure. The diagnosis is frequently rendered doubtful by the absence of a mass in the pelvis or the presence of gastric symptoms such as nausea and vomiting; symptoms which, if accompanied by pain in the right lower quadrant, may well suggest appendicitis. Cases are often diagnosed as salpingitis and appendicitis, and we have seen diagnoses of food poisoning and perforated gastric ulcer.

In order to arrive at a better understanding of this interesting condition it is necessary to inquire into the etiologic factors concerned and the nature of the pathologic process present. To a great extent our knowledge of the etiology of extra-uterine pregnancy is purely theoretical, so that it is impossible to point out the specific factor in each case. One of the most common etiologic agents is an old tubal inflammatory process. This must be one which has attacked the tubal mucous membrane causing adhesions which either narrow or completely close the lumen of the tube. The gonococcus is the most common organism causing this type of salpingitis. In some cases the endosalpingitis is very mild and only brings about adhesions between the four primary plicæ in the narrowest portion of the tube. The tubal lumen is narrowed enough to prevent the passage of the ovum into the uterus and it becomes embedded in the wall of the tube.

In other cases the tubal lumen is completely closed by the inflammatory process. It may remain closed for several years, when due to a slow healing it may open sufficiently to allow a spermatozoan to pass through, but not permit the fertilized ovum to pass to the uterus.

In the first type the patient will give a history of a previous inflammatory process which was so mild that she thought very little of it. Close questioning, however, will usually give a history of a suspicious vaginal discharge with or without attacks of pain in the lower quadrants.

In the second type we see the "one child sterility cases." These people after one pregnancy use no contraceptives but fail to become pregnant. This condition may last for several years, when she has an ectopic pregnancy. Close questioning will usually give a history of infection during the puerperium or following an abortion.

Those cases in which there is no history of salpingitis are very perplexing. In some,

*From the department of Obstetrics and Gynecology, University of Michigan.

†Dr. James M. Pierce graduated from the University of Michigan with a degree of M.D. He attended the Literary College of the University of Michigan for three years. He interned for two years in the University Hospital at Ann Arbor, was an instructor in obstetrics and gynecology for three years, and Assistant Professor for two years. He is now Associate Professor of Obstetrics and Gynecology in the University of Michigan.

diverticula in an otherwise normal tube or the presence of an accessory tube may be the causative agent. Sippel bases his theory upon the fact that he has seen an ectopic pregnancy occur in a woman whose right ovary and left tube had been removed. He believes that fertilization occurred in the pelvic cavity and that due to the time consumed in the passage of the ovum from the left ovary to the right tubal ostium it became so large that its passage down the tube was impossible. Also after a certain period the trophoblastic layer of the fertilized ovum develops a corroding capacity which aids it in embedding itself in the endometrium. In normal fertilization and passage of the ovum into the uterus this corroding action is not developed until the ovum reaches the uterus. If too much time is taken in its passage, as from the left ovary to the right tube, this action may take place as soon as it reaches the tube so that it immediately embeds itself in the tubal wall.

Katz bases his theory upon the fact that in normal pregnancy a definite change takes place in the tubal mucous membrane. The cylindrical cells lining the tubes become heaped up and lose their cilia. If fertilization should occur near the ovary the ovum might not be able to pass through the tube due to the decrease in size of the tubal lumen.

Other possible etiologic factors are an infantile condition of the tubes and an isthospasm. In the first condition the tubes are much elongated and tortuous in their course. In the second there occurs a spasm of the isthmic portion of the tube. It is known that there is such a tubal spasm but how often it causes an ectopic pregnancy one cannot say. There are many patients upon whom a Rubin test is made for sterility and the tubes are found apparently closed. But if these patients are anesthetized and the test repeated it is found that the gas passes through the apparently closed tube. If this condition can cause sterility why can it not be the cause of ectopic pregnancy?

Anatomically the tube may be divided into three parts, the interstitial, isthmic and infundibular portions. Pregnancy may occur in any portion but is more common in the last two. If pregnancy should occur in the interstitial portion it is possible for it to abort into the uterus, become attached there and develop normally. Such cases have been reported. Or rupture of the tube may occur relatively early and a tremendous hemorrhage result because at this point the uterine and ovarian arteries anastomose. If pregnancy occurs in the isthmic portion rupture usually occurs. In the infundibular portion either rupture or abortion may occur.

Pathologically, then, there may be two types of termination of tubal pregnancy—tubal abortion or tubal rupture. Both are due to the same process, *i.e.*, growth of the ovum in a limited space and the corroding action of the trophoblastic layer of the ovum. Litzenberg has shown that the normal uterine decidua has a distinctly protective action due to its resistance to the corroding action of the ovum. He has further shown that in a tubal pregnancy there is no true decidua to resist the ovum. Hence the tubal wall and blood vessels are rapidly corroded, the intervillous spaces become filled with an abnormally large amount of blood and the ovum becomes detached. This is a tubal abortion. If the tubal wall becomes greatly thinned due to the increasing tension and corrosion, rupture occurs.

If the tubal abortion should occur near the abdominal ostium the ovum may be expelled from the tube and become reattached to the ovary or some abdominal organ. More often the ovum remains in the tube, where it is quite rapidly absorbed. At the same time there is bleeding at the site of detachment. This blood drips from the abdominal ostium and collects in the pouch of Douglas, forming a pelvic hematocele.

Should rupture of the tube occur there may be a complete rupture with a sudden severe hemorrhage or an incomplete rupture, the tube merely yielding enough to allow for the rapidly rising tension within it.

When pregnancy occurs in the tube a decidua appears in the uterus accompanied by a great venous congestion. If the tubal pregnancy is interrupted this uterine decidua is usually cast off in shreds and hemorrhage occurs from the venous sinuses which have been opened. This bleeding will continue until the tubal pregnancy is removed or absorbed, when the uterus will undergo a normal involution.

From the above it would appear that there should be two distinct groups of symptoms depending upon the type of termination which has occurred—tubal abortion or tubal rupture. These symptoms usually appear during the first two months of pregnancy

although cases have been reported which have gone for a longer period. If there is a sudden and complete rupture of the affected tube the physician usually finds the patient in shock, bloodless, and complaining of pain in the lower abdomen. There is usually a history of having skipped one period or the expected period was ten to fourteen days late. Examination will show signs of an internal hemorrhage. The lower abdomen is tender but not rigid. Pelvic examination may show a tender mass in one side, in the pouch of Douglas, or a complete absence of any mass in the pelvis. This merely means that the blood has not clotted yet.

The temperature is rarely above 99 to 99.5° F. and the white blood count is normal. The sedimentation rate in all of our cases has been high. The hemoglobin is high because the blood is concentrated. In 24 to 48 hours it will fall due to the dilution of the blood as its volume increases. The diagnosis is made from the history and the picture of an internal hemorrhage. Luckily this type of termination is least common.

Should the ovum be aborted into the abdominal cavity from the tubal ostium it may become reattached, absorbed or calcified. It is not a rare occurrence to find a small calcified fetus in the pelvis when operating upon the pelvic organs for some other condition. In this type of termination the patient usually has a sharp pain in the lower abdomen followed by vaginal bleeding. There may be no other symptoms and a physician may never be called.

The most common type of termination has purposely been left until the last. I refer to that type in which there is a detachment of the ovum from the tube wall or only a partial rupture of the wall. In either case there is only a moderate hemorrhage or a slow oozing from the abdominal ostium. These patients complain of dull pain with cramps at times and exquisite tenderness in the lower abdomen. They usually give a history of having skipped one period or the expected period was late. Suddenly cramp-like pains occurred and in 24 to 48 hours vaginal bleeding began, which they often think is the appearance of the expected period. However, the bleeding continues for 10 to 14 days accompanied by more cramp-like pains which may have been more or less severe than the first attack.

Examination usually shows few or no signs of hemorrhage. The lower abdomen may feel rigid at first but careful examination will show this to be a voluntary spasm due to the extreme tenderness. Pelvic examination shows a bloody vaginal discharge. There is usually a mass in the pouch of Douglas connected with one in the broad ligaments. This mass may vary markedly in consistency and size but is always tender. In some there is no mass in the cul-de-sac and only a lemon-sized lateral mass. In others there may be a large mass in the cul-de-sac which may feel doughy or hard and firm like an adherent pyosalpinx.

The temperature is seldom above 99 to 99.5° F. and the white blood count normal unless there is much peritoneal irritation or infection of the hematocele. The percentage of hemoglobin depends upon the amount of hemorrhage and the number of days that it has been taking place.

If the mass is doughy the diagnosis is made certain. But if it is hard and the patient gives an inflammatory history the picture is greatly distorted. The temperature, pulse and white blood count are usually not high enough for so extensive and apparently so active an inflammatory process. If, however, the temperature and white blood count are elevated a differential diagnosis can be made by introducing a small trochar into the mass in the posterior cul-de-sac.

If there is no palpable mass the diagnosis must be made from the history only. There have been three cases in our clinic during the past year who have had no palpable masses and whose abdomens have been filled with both fresh and clotted blood. This free blood in the abdominal cavity may cause nausea and vomiting or diarrhea due to its irritation of the bowel. We have seen one case in which there was nausea and the vomiting of blood accompanied by pain over the whole abdomen. There was also vaginal bleeding, which was disregarded. The patient was operated for a perforated gastric ulcer and a ruptured ectopic found.

It would seem, then, that the history, the absence of fever and elevation of the white blood count are the most constant and important factors in the diagnosis of ectopic pregnancy. The presence of a mass in the pelvis may make the diagnosis either easier or harder depending upon its character. Its presence is not necessary for diagnosis and

its character can always be determined by introducing a small trochar into the posterior cul-de-sac. This trochar may be as large as a lead pencil, and will do no harm if one keeps in the midline and very close to the posterior wall of the cervix and lower uterine segment. If pus appears the pyosalpinx may then be drained through the vagina. If blood appears a laparotomy can be performed immediately.

In conclusion, therefore, we believe that one cannot make the diagnosis from any one sign or symptom but must consider the whole picture. We have found that this picture is peculiar in that the temperature is only slightly elevated and the white blood count low unless there is much peritoneal irritation or infection of the hematocele. There is always the history of a skipped period, pain in the lower abdomen and vaginal bleeding. When this history is accompanied by the laboratory findings peculiar to the disease, we believe the diagnosis of tubal pregnancy should be considered first of all. And if blood is obtained upon needling the post cul-de-sac, a laparotomy should be performed immediately.

AN UNUSUAL ANOMALY OF THE PELVIS

WM. M. DUGAN, A.M., Ph.B., M.D.†
and
W. O. UPSON, M.D.‡
BATTLE CREEK, MICHIGAN

From the various congenital deformities of the pelvis, recorded in the medical literature, extrophy of the bladder with the associated separation of the pubic arch seems to be rather uncommon. In a fairly extensive review we were able to find only 23 reported in spite of the fact that descriptions of this kind have appeared since 1723. At this time J. & Jurin J. Huxham reported such a case associated with pregnancy. Their quaint description is as follows:

"The subject of this report was a woman of Lanteglass, near Fowry, who married at the age of 23 and soon thereafter became pregnant. At about the seventh month of pregnancy, accompanied by her mother, the woman sought the services of Mr. John Bonnet, a surgeon practicing at Fowry, Cornwall. On viewing the woman's abdomen, Mr. Bonnet found no umbilicus; about 3 inches below the normal location of this feature, there was a fleshy protuberance suggesting a hen's egg in shape and size. This mass had the appearance of 'proud flesh,' and was so tender no pressure upon it could be endured by the patient. On the lower surface of the mass were two small orifices about one inch apart and through these urine dropped or spurted, she being quite unable to control it. A quarter inch below the mass was a transverse opening, having an appearance similar to the anus of a fowl. From this opening the woman had been accustomed to menstruate, and it had served as the channel of cohabitation. The surgeon by thrusting his finger into this opening was enabled to feel a firm transverse membrane which apparently separated the passage where his finger was, from another similar to it, the orifice of which appeared about two inches below that into which the finger had been thrust. This lower orifice occupied the situation of the symphysis pubis of the normally formed woman. A few hairs were sprouting about this orifice. Below this again, appeared the anus, its sphincter being normal but more forward than the normal.

"The woman had thus an opening corresponding to the normal vulva; a supernumerary opening which appeared also to communicate with the womb; no uterine os, nor os pubis, although there did appear an apophysis jutting out from the lower part of each os ilium, but not in any way joined by synchondrosis, as in normal women.

"Labor began late at night, July 18, 1722. The pains were excessively violent but no dilatation of the vagina's orifice took place. The anus, however, was opened wide by each access of labor pain. No progress being made in delivery, the mother went into convulsions and the surgeon perceived that without surgical incision both mother and child would speedily perish. When they believed her at the point of death the relatives gave Mr. Bonnet permission to do as he saw fit, promising to hold him blameless should death occur. Thrusting his scalpel into the inferior oblong orifice he cut into the upper one, thus making them into a common opening; with scissors he cut through the membranous septum between the communicating passages. He now had room to thrust in his hand, seized the child's head, and with his finger in its mouth, delivered it alive. It was a female and well formed.

"The woman recovered and lived on, but miserably, for in standing or walking the uterus continually fell down and she would not permit Mr. Bonnet to remedy this by a suturing, as is done when

†Dr. W. M. Dugan graduated from Brown University in 1907, Ph.B. Graduated from Medicine from the University of Michigan in 1916. Instructor in Medicine, Post-Graduate School, New Orleans, La., in 1916 and 1917. In general practice of Medicine and Surgery in Battle Creek, Michigan, from Sept. 1917, to the present date.

‡Dr. W. O. Upson graduated from Medicine from the American Medical Missionary College of Chicago in 1902. Was in general practice for 15 years. In 1907 and 1908 was part-time instructor in the Colorado Agricultural College at Ft. Collins, Colo. From 1917 to 1928 served as Roentgenologist at the Battle Creek Sanitarium. Since 1929 he has served as full-time Roentgenologist at the Leila Y. Post Montgomery Hospital, Battle Creek, Michigan.

the vulva breaks into the anus (recto-vaginal fistula?). Ulcers formed continually upon the body of the womb and the vagina because the unobstructed urine from the two small holes in the protruding mass continually poured over them. If the feces were thin and watery, a certain part of them also came at times through the cleft, and the surgeon on introducing his finger could protrude the tip of it into the anal orifice."

Other early writers that might be mentioned are John Bonnet, who reported a case in 1724; H. A. Hamilton in 1835, which was the first case to appear in American literature; and D. Ayres, who reported a case in 1859.

The monograph describes a plastic operation done upon an unmarried woman aged 28 years, who entered the Long Island College Hospital November 1, 1858, with the following history: On July 5 previous she had been delivered of a well developed child, having carried it to maturity without extraordinary difficulty. Labor commenced with free hemorrhage (footling presentation) and had lasted two hours, at the end of which time the child was born dead. The perineum was uninjured. Recovering from her confinement prolapsus uteri ensued, the organ finally presenting continually at the vulva. Examined at the Long Island College Hospital, it was found that the distance between the pubis abutments was about three inches. The bladder formed a tumor above, the nymphæ were widely separated on each side of the vulva, and the entire surface of the area between was covered by mucous membrane continuous with the lining of the vagina.

Since that date 15 other cases have been reported; of these one of the most interesting was by Randolph Winslow and appeared in a monograph in 1916. He stated that in May, 1886, a female child age six years was placed under his care for operative correction of bladder extrophy. A modified Wood's plastic operation was performed, consisting of turning flaps over toward a point somewhat below the normal location of the umbilicus, leaving a small opening through which urine escaped. In an account of this case cited in Kelly's *Operative* Gynecology we are told "the pubic bones were departed four centimeters with a thin, sharp edged fibrous band between them; above, there had been a total defect of the anterior bladder wall covered by inverted flaps of skin. He found an infantile uterus and ovaries, and on making cystoscopic examination between the flaps, two little oval openings representing a double hymen were discovered on the posterior wall of the bladder; a sound passed through them led upward to the cervix uteri. The girl was at this time 15 years old. Dr. Winslow heard no more of the patient until January, 1914, when Dr. C. B. Reynolds of Philadelphia wrote him that he had recently delivered her of a child. This was her third child; the first having been born in November, 1901, following an instrumental delivery. This child was born alive. The second child was delivered by podalic version in 1903 and was born dead. The mother was badly lacerated and had her injuries repaired at the Cambridge Maryland Hospital. The third child was delivered at the Medico-Chirurgical Hospital, breech presentation with dead fetus. A skiagraph taken of her pelvis . . . showed an absence of the symphysis pubis and a gap three inches between the pelvic bones. In January, 1915, she was delivered by Dr. Reynolds of a fourth child, a girl weighing 9 pounds, which was born alive. This was a shoulder presentation which was delivered by podalic version. Other than a prolapsus uteri the woman remained in good health, and was able to carry out her ordinary domestic duties.

Another interesting report appeared in 1916 by Green and Armitage.

The patient was sent to Dr. Armitage (resident in Calcutta) from Burma for delivery, because in 1912 he had assisted his then Chief, Col. C. R. M. Green, in performing a Peters' operation upon her, the ureters being transplanted into the rectum. When she arrived in Calcutta she was eight months pregnant; the bladder extrophy was complete; the cervix protruded 1 inch at the vulva and the pubic bones were 4½ inches apart. The iliac crest measurement was 9½ inches, and the anterior superior spines measurement was 10½ inches. The fetus was lying absolutely transverse with the back upwards, which was confirmed by X-ray examination. P.V. the vagina measured 1½ inches and in the posterior cul-de-sac there was a dense hard resistance as of some old inflammatory deposit. The author recalled that convalescence from the ureteral transplantation had been complicated by a large parametrial phlegmon. The patient was 11 years old when this occurred; she was now 25. When labor set in an attempt was made to do external version, but owing to the mass of old inflammatory deposit in the hollow of the sacrum it was found that the head was causing the exposed bladder surface to bulge, and it was feared injury to the transplanted ureters might occur. Transperitoneal cesarean section was decided upon and a healthy 5-pound child delivered. Recovery was uneventful and was not followed by uterine prolapse, as had occurred in practically all the previously reported cases. The paper is accompanied by a large roentgenogram showing the separation of the pelvic bones and the inflammatory mass in the hollow of the sacrum.

The last case to be reported in the literature was by Eberbach and Pierce in 1928.

At the age of 19 the patient underwent ureteral transplantation because of extrophy of the bladder. Within 2 years she had married and re-entered the University Hospital (Ann Arbor, Mich.) pregnant at term. The vagina admitted two fingers but was surrounded by dense scar tissue. The scars of the

Fig. 1.

plastic repair of the bladder wall and the incisions for ureteral transplantation were well healed and showed no sign of hernia. Bony separation of about 4 inches at the symphysis. The anterior posterior diameter of the pelvis was normal, but there was a marked flare of the ilia, the intraspinous diameter being 30 centimeters. Because of the small vagina and the great firmness of the scar tissue cesarean section seemed indicated; also because it was possible that the absence of the anterior part of the bony pelvis might cause a disproportion. A normal 5½ pound female child presenting in the right occipito-anterior position was delivered. Convalescence was normal. (Nothing is said of postpartum uterine prolapsus.) A roentgenogram showing the exceptionally wide space of the split pelvis was included in the report.

The only case of split pelvis not associated with the extrophy of the bladder was reported by Friedrich Schauta in 1899, in which he states:

Woman, 23, secundipara. First child was born normally and spontaneously. No operation on symphysis at any time. No history of any rupture or accident; no scar. Upon palpation a depression like a groove could be felt, into which the fingers could be inserted easily, similar to that felt after symphysiotomy. External measurements of pelvis a little below normal, as in rachitic pelvis; distance between spines 23 cm. intercristal measurement 25.5 cm.; intertrochanteric 31.5 cm. Upon internal examination the ends of the symphysis could be felt moving towards each other when pressure was made upon the iliac fossæ; the promontory was very high, the sacral flexure normal in both directions. There could be no doubt whatever of the diagnosis of split symphysis. Congenital split of this kind is not a rare occurrence, but Schauta finds no case in the literature of a *pregnant woman having this without ectopia of the bladder,* since as a rule the split is only one part of a larger split involving the abdominal walls and urinary bladder. The only case known to the author where the split was not of this kind is that of Walter, described by Gurlt; and this was not in a pregnant woman.

The second delivery also proved to be easy and spontaneous. The fact that the fissure was still open on the ninth day afterward argues for its congenital nature. While it has no interest obstetrically, it is deeply interesting as an anomaly of formation. The case is not wholly like the textbook form described by Litzmann, but is more nearly that described by Breus, where the high promontory is conspicuous. In the fact that only the *external* measurements re-

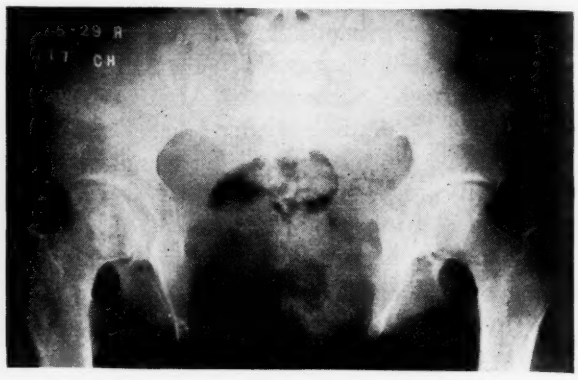


Fig. 2.

sembled rachitic pelvis is found another deviation from the typical Litzmann picture.

The case we wish to report is Mrs. D. of Bellevue, Michigan; first consulted one of us (Dr. Dugan) January 4, 1929. She believed herself six months pregnant, her last menstruation period being July 20, 1928. She had two previous pregnancies, one a spontaneous abortion December, 1926, at the end of the third month. She was again pregnant April, 1927. This time she was aborted at the end of the third month by her family physician and told she could never carry a baby, much less deliver one, due to her physical malformation. Her family history was negative. Father and mother living and well. Four sisters and five brothers all living and well, all normal. No history of hereditary diseases. She had the usual diseases of childhood. Pneumonia eight years ago; made a complete recovery. As a child she could run and play and climb just as well as other children. She has never been troubled with stomach trouble, shortness of breath or has never experienced any difficulty holding her water or urinating. She has always led a busy, useful life. Patient is above ordinary intelligence and has always enjoyed the best of physical health. Her menses began at 13 years, have been regular, 28-day type. There has been considerable pain at periods.

Physical examination: The patient is well developed and healthy, height 5 feet 2 inches. Weight 120 pounds. Eyes react to light and accommodation. The teeth are good. Throat normal. No goiter. The lungs expand well, there are no râles or dull areas. Heart, no shocks, thrills, murmurs or displacement. Abdomen, there is no umbilicus; in place of it there is a small scar in the right inguinal region where the cord was attached. The fundus of the uterus is about 6 inches below ensiform process. There is extrophy of the bladder which presents a diameter of 4 inches and a height of 3½ inches through abdominal wall in the inguinal region a little to the left of the midline. The pubic hair extends into clefts right and left from a triangular space in the mons veneris which is denuded of hair. There are no pubic bones. The vagina is double with partial septum. The vaginal opening is high up at a point where the symphysis should be. The rectum is at the site of a normal vaginal opening. The labia majora are deformed, assuming a circular

arrangement around two very small vaginal openings. The cervix of the uterus is blunt and meets the vagina at practically a right angle. No tip of the coccyx can be felt. Pelvic measurements were taken carefully. In estimating the external conjugate we judged the point where the symphysis pubis is normally found. Spines 22½ cm. Crests 26 cm. Trochanter 32 cm. C.D. 17, Sup. St. 16 cm. Blood pressure 116/70. Urine was normal. Blood count 4,500,000 reds, 7,000 whites, hemoglobin 85 per cent. Wassermann, negative.

An X-ray examination of the pelvis was made and revealed nearly a full termed fetus (Fig. 1) lying in the normal L.O.A. position. There was a congenital deformity of the pubic arch, probably due to an arrest in the development of the ischium and pubis (Fig. 2). The anterior part of the pelvic girdle was absent. The pubic bones were separated about 5 inches. The superior rami were shortened and directed forward. The obturator foramen was diminished in size, narrowed and turned outward. The hips were widely separated, the inner borders of the acetabuli were at least seven inches apart. The iliac bones were abnormally flattened. The sacrum was also deformed. The lateral curve instead of being concaved was flattened, and the ileo-sacral facets were turned more outward than normal. There was a complete absence of the fourth and fifth segments of the sacrum and the coccyx.

The patient went into labor April 6, 1929, at 8 A. M. She was in good condition. The fetal heart sounds were 140 in mid-abdomen. She made no progress because there was no fulcrum for her to obtain leverage, the pubic bones being absent. All kinds of binders were applied to supply the natural deficiency of bony formations. Manual pressure to the lower abdomen was applied but these procedures did not help. There was some attempt at bearing down but at each contracture the bladder was pushed forward. And at 10 P. M., after 14 hours' labor, there was absolutely no dilatation of the cervix. At this hour Dr. R. V. Gallagher saw the patient in consultation. He advised cesarean section with the vaginal route the more desirable, as the bladder occupied that portion of the abdomen through which a classical cesarean section could be done. He also advised giving the patient several more hours trial of labor before resorting to operative procedure.

The patient was in severe pain until 3:30 A. M. April 17. She was very tired. She made no progress. She was taken to the operating room and given a nitrous oxide anesthetic. A vaginal section was done. The cervix of the uterus was split laterally at its thinnest point. The uterus was distorted so that the chief blood supply was in a vertical plane rather than its usual position in the lateral plane. The bladder was retracted and held out of the way. A male baby weighing 6 pounds 15 ounces was delivered at 4 A. M. The placenta was expressed in 5 minutes by Credé method. There was very little bleeding. The uterus and vagina were sewed by No. 2 chromic. The baby was in excellent condition and remained so until he left the hospital. The mother made an uneventful recovery and was discharged from the hospital 12 days after the operation. She was feeling perfectly well, was able to walk around, dress herself and dress the baby.

We have followed this case and on November 13, 1929, about seven months after delivery, both the mother and baby were in fine health.

BIBLIOGRAPHY

1. Huxham, J., and Jurin, J.: Partium Genitalium in Muliere Structura praeternaturalis. Trans. Philos. Soc. London, 32:671, 1723. (No. 379.)
   Bonnet, John: On the preternatural Structure of the Pudenda in a Woman, described in Philos. Trans., No. 379. Trans. Philos. London, 33:42, 1724.
2. Hamilton, H. A.: A singular malformation. Boston M. & S. J., 11:93, 1835. (First case reported in U. S.)
3. Ayres, D.: Congenital extrophy of the urinary bladder and its complications successfully treated by a new plastic method. (Monograph.) New York, 1859.
4. Litzmann, C.: Arch. f. Gynek., 4:266, 1872.
5. Gunsberg, M.: Geburt bei gespaltenem Beckem und Ectopie der Harnblase. St. Petersb. Med. Zeitschr., n. f. 3, 1872.
6. Gusserow: Berl. Klin. Woch., No. 2, 1879.
7. Klein: Arch. f. Gynek., 43:549, 1892-3.
8. Waldstein: Monatsch. f. Geburt., 6:273, 1897.
9. Willard, F.: Extrophy of the bladder; pubic bones absent. Trans. Acad. Surg. Phila., 1:134, 1899.
10. Schickle: Beit. z. Geburt. u. Gynek., 4:243, 1901.
11. Adam: J. Obst. & Gynec. British Emp., 2:377, 1902.
12. Schmidt, H. B.: A report of a case of extrophy of the bladder with split pelvis in a woman the mother of two children. Trans. Clin. Soc. Unit. Michigan, 3:8, 1911-12.
13. Bazy: A propos des deformations du bassin dans l' extrophie de la vessie. Bull. et mem. Soc. de Chir. de Paris, n. s. 33:758, 1912.
14. Moorhead, J. J., and Moorhead, E. L.: Extrophy of the bladder; report of two cases. Jour. A. M. A., 66:409, 1916.
15. Winslow: Extrophy of the bladder. Surg., Gynec & Obst., 22:350, 1916.
16. Miller, C. J., and King, E. L.: Complete extrophy of the bladder with split pelvis as a complication of pregnancy. Am. J. Obst., 78:267, 1918.
17. Sage, E. C.: Unusual example of extrophy of the bladder, with marked separation of the pelvic bones. Am. J. Obst. & Gynec., 8:497, October, 1924.
18. Green-Armitage, V. B.: Complete extrophy of the bladder with split pelvis; Peters' operation in 1912 with subsequent complication of pregnancy; cesarean section and recovery in 1926. J. Obst. & Gynec. British Emp., 33:436, 1926.
19. Schauta, F.: Ein Fall von Symphysenspalt ohne Ectopia Vesicæ. Allg. Wein med. Ztg. 44:157 u. 163, 1899.

PHYSIOLOGY OF MENSTRUATION

RUSSELL W. ALLES, M.D., F.A.C.S.
DETROIT, MICHIGAN

The phenomenon of menstruation is one which has been surrounded with a great deal of mystery throughout all the ages and it is only relatively recently, in fact during the present decade, that any sort of adequate explanation has been evolved to replace the widely divergent and often bizarre theories propounded to explain its mechanism of occurrence.

At the outset it may be stated that the phenomena taking place in the generative tract in the intervals between menstruations have a very definite purpose, which is to prepare the individual for the advent of a pregnancy, and in the event that impregnation does not occur, menstruation takes place so that the old preparation may be broken down and a new process of preparation instituted. The average time required for the entire process is about twenty-eight days, although some variations do occur normally, but for the purpose of this description a complete cycle of twenty-eight days will be assumed. We shall also arbitrarily assume the cycle to begin with the first day of menstrual bleeding, for this furnishes us the only externally recognizable sign of any part of the process.

While it is undoubtedly true that the other glands of internal secretion, especially the thyroid and hypophysis, have some influence in the menstrual processes, so little is certainly known pertaining to their action in this respect that we can do little more than state that they probably play some part, the exact extent of which is at present unknown. However, we do know that the greatest and most interesting phenomena take place in the ovary and the uterine mucosa, so that it will be these structures to which our attention will be turned throughout this discussion.

At the time of birth the cortex of the ovary is composed of large numbers of primordial ova separated from each other by a rather dense network of connective tissue stroma and the number of these ova has been variously estimated at from 35,000 to 60,000. Each ovum is surrounded by a single layer of endothelium-like flat cells which are to become the follicular epithelium. Already at birth a number of these primordial follicles may be seen toward the hilus of the ovary undergoing certain changes which continue in successive follicles throughout the life of the individual up to the menopause.

The follicular epithelial cells become larger and increase in number so that instead of a single layer of flat endothelial-like cells surrounding the ovum, two or three layers of cuboidal cells are formed. Meanwhile the adjacent connective tissue stroma becomes looser and more edematous and by the time the follicle has reached the size of 100 to 150 microns in diameter some of the stromal cells have arranged themselves into a dense layer around the follicle and fine capillaries may be seen extending to this layer which now becomes the theca interna of the follicle. The theca interna undoubtedly sustains nutrition for the follicle and also brings about its resorption in the event that it does not reach full maturity. The follicular cells continue to increase in number in such a fashion that the ovum assumes an eccentric position in the mass, after which a fluid-filled cavity is formed in the main mass of cells, the follicular cavity, leaving the ovum imbedded in a group of cells situated on one part of the periphery of the follicle, the cumulus oöphorus. The follicular cells, which are also called granulosa cells, undergo still further increase in numbers while at the same time the follicular fluid increases in quantity and when the follicle reaches a size of about .5 millimeter in diameter it gradually begins to approach the periphery of the ovary. During the entire period of growth of the follicle the stromal cells which have formed the theca interna undergo a concomitant increase in number, vascularity and fluid content, probably in order to maintain nutrition as well as to facilitate absorption of such hormonal substances as are elaborated by the follicle.

Up to the age of puberty the follicle usually does not develop to exceed the size of .5 mm. although some are occasionally

found which reach a diameter of 1 to 2 millimeters. All of these follicles are destined to undergo atresia so that by the time the age of puberty is reached the number of ova present in the ovaries has been reduced by about one-half and it is highly probable that the development, degeneration and absorption of these follicles along with their elaborated secretion has a great rôle in the production of the secondary sex characteristics. When such a follicle is destined to undergo astresia the ovum contained therein first loses its sharp definition and dissolution of the nucleus occurs, to be followed by degenerative changes and gradual absorption of the follicular or granulosa cells along with the follicular fluid and ovum. During all of this process the tunica interna remains intact until the entire follicle has been absorbed, after which its cells gradually become rearranged to take their places along with the rest of the stromal cells of the ovary, leaving no trace of the previous existence of a follicle. Thus far we have dealt only with the follicles developing from the time of birth up to the time of puberty, the uniform fate of which has been follicular atresia. Atresia may occur at any time in the course of development of the follicle even when it has almost reached full maturity; in fact, relatively few of them are destined to complete development.

After the age of puberty has been reached follicles continue to form as heretofore described, but as menstruation approaches, a single one situated near the hilus of the ovary may be seen to grow much more rapidly than the others and approach the periphery of the ovary. The ovum itself increases to about five times its previous size, partially by enlargement of the nucleus, but chiefly by a marked increase in protoplasm of the cells forming the so-called zona pellucida. The follicular fluid increases and the follicular epithelial cells grow correspondingly in number, forming a lining two to four cells deep except at the site of the ovum, where they are heaped up to form the discus ovigerus. A single layer of granulosa cells surrounding the ovum undergoes enlargement and is called the corona radiata. As the follicle enlarges and approaches the periphery of the ovary the discus ovigerus is gradually displaced until it occupies a position in the follicle nearest the periphery. Meanwhile, the stromal cells forming the tunica interna keep pace, increasing in number and vascularity to form a loosely knit network of cells around the follicle except at its most peripheral portion which is to become the stigma or point of rupture of the follicle. Here there are few stromal cells and practically no blood vessels. When the follicle has reached a diameter of 12 to 18 millimeters it has gained the periphery of the ovary and appears as a cyst-like projection on the ovarian surface until rupture takes place. At the time of rupture, the ovum, together with its corona radiata and some of the cells of the discus ovigerus, is set free to enter the fimbriated end of the fallopian tube. The most rapid rate of growth of the follicle begins a few days after the beginning of a menstrual flow and rupture takes place sometime between the thirteenth and sixteenth day.

With the rupture of the follicle its wall collapses and the layer of granulosa cells, which maintains its intimate connection with the tunica interna, becomes folded upon itself. Many ruptures of capillaries occur in the theca interna, extruding blood cells and plasma through the granulosa layer into the cavity of the follicle and a fine network of fibrin is formed, in the meshes of which red blood cells may be seen entangled singly and in small groups. The fibrinous coagulum fills out the follicle occluding the point of rupture and at this time the whole structure assumes a size comparable to that of the original follicle. The capillaries present in the tunica interna send out shoots of endothelial cells through the granulosa layer into the interior of the follicle, from whence they turn back to embed themselves in the granulosa layer, the cells of which begin to undergo such a rapid increase in size that in a few days they become from two to four times their original size and the whole structure, which is now called the corpus luteum, ordinarily varies in size from that of a cherry to that of a hazel nut but may occasionally reach the size of a walnut or even a small hen's egg. In the latter half of the first week rapid vascularization takes place and the corpus luteum appears on the surface of the ovary as a yellowish-red mass of tissue projecting beyond the ovarian surface. At this time the structure has reached the character of a complete endocrine gland.

During the second week of its existence (*i.e.*, following rupture of the follicle) the connective tissue cells of the tunica interna

invade the granulosa layer and form a layer of connective tissue cells between the granulosa and the fibrinous central portion of the gland.

At the beginning of the third week after ovulation, if the ovum has not been fertilized, a sudden change takes place in the corpus luteum. The granulosa cells undergo fatty degeneration, lose their well defined character, and become very much smaller. At the same time the connective tissue cells derived from the tunica interna invade the fibrinous central portion of the gland along with capillary shoots, the fibrin is rapidly vascularized and removed by solution and phagocytosis, the effect being a rapid, marked reduction in size of the corpus luteum. Invasion of the granulosa continues, the whole structure recedes toward the hilus of the ovary, leaving an indentation on the periphery. The degenerated granulosa cells gradually disappear until at about the end of the tenth week no trace of the previous existence of a corpus luteum exists except a small collection of connective tissue cells which are themselves destined to gradual obliteration. The beginning degeneration of the corpus luteum corresponds practically identically with the appearance of the menstrual flow.

Synchronous with the cyclic phenomena just described as taking place in the ovary certain changes also occur in the uterine mucosa for the understanding of which it is necessary to first discuss some general characteristics of the uterine lining. It is composed of tubular glands which dip down to the muscular layer of the uterus and are lined with a single layer of columnar cells. The glands lie in a stroma of greater or less density and are always uniform in number, there being from two to four to each square millimeter of mucous surface. The stroma is made up of two types of structure, cellular and fibrillary. The cellular structure is composed of star-shaped connective tissue cells whose protoplasmic processes unite with those of adjacent cells to form a well connected latticework, while in the interstices between the cells is a network of fine fibrils. The stroma is further differentiated into a deeper densely packed cellular layer, with very few fibrils in the interstices between the connective tissue cells, lying next to the uterine muscle and called the basalis, and a superficial less compactly constructed layer with fewer cells and more fibrillary structure between the cells called the functionalis, for it is in this layer that most of the manifestations of the cyclic function are borne. The blood vessels, as they emerge from the muscularis, divide into small arterioles having a well defined muscular coat and adventitia as they traverse the basalis but, as they penetrate the functionalis, they again divide into numerous capillaries whose walls are made up solely of endothelium. Nerve fibres are found in all strata of the uterine wall up to the functionalis but, in spite of the most painstaking methods, they have never been demonstrated in the latter structure. This fact is of immense interest in showing that the most striking changes may be brought about in tissue by hormonal influence without the intervention of the nervous system.

In infancy and senility, when there is no functional activity of the endometrium, there is no differentiation of the stroma into layers, the whole structure having the compact cellular character of the basalis. As puberty approaches, a superficial layer having the previously described characteristics of the functionalis is formed from cells arising in the basalis and it is from the basalis that the functionalis is constantly regenerated throughout the sexual life of the individual.

The basal layer of the endometrium does not undergo any changes during the menstrual cycle except to furnish the matrix from which regeneration takes place. Its stroma is characterized by the dense arrangement of its connective tissue cells with very little intercellular structure and its glands are lined by a single layer of columnar epithelial cells. The lumina of the glands are always narrow and empty except when secretion is forced down from their upper portions, for the parts of the glands lying in the basalis do not show any signs of secretion during the entire menstrual cycle. The blood vessels of the basalis are small, although they have well defined muscular coats and are fairly numerous. The thickness of the basal layer remains rather uniform throughout the menstrual cycle and averages about .5 millimeter, subject to individual variations.

For the description of the changes in the functional or nidation layer it is convenient to divide the cycle into several periods, namely: proliferation, secretion, desquamation, and regeneration. At the beginning of

the period of proliferation, which is about the fifth day after the beginning of menstrual bleeding, a narrow but definite functional layer is developed from cells arising in the basalis. Its stromal cells are rather densely packed but still readily to be differentiated from the basal layer and few mitoses are found in the cell nuclei. The glands are straight and their lumina are devoid of secretion. From about the seventh to the tenth days the functionalis undergoes a marked increase in thickness, many mitoses are found, the stromal cells increase in number and their star-shape becomes manifest. The density of the stroma is decreased by the appearance of a fibrillary network in the intercellular spaces. The glands keep pace with the increase in thickness but remain straight and their lumina are empty. From the tenth to the fourteenth days the functionalis continues to become thicker, the stroma appears looser because of the increase of intercellular structure and fewer mitoses are found. Slight convolution of the glands is noted although they still remain narrow and show no signs of secretion. The layer has now reached about its limit in thickness.

The period of secretion begins about the fourteenth day and from its beginning to about the twenty-first day the structure of the stroma becomes progressively looser on account of an increase of intercellular fibrils as well as accumulation of tissue fluid between the cells. Mitoses disappear and the glands become markedly convoluted. The epithelium of the glands always remains as a single layer of columnar cells, the convolutions being produced by the increase in numbers throwing them up in folds. The cells of the glandular epithelium become larger and glycogen granules are found within them. Thus far only small amounts of secretion are found in the lumina of the glands.

From the twenty-first to the twenty-eighth days a rapid and marked glandular secretion takes place until they appear enormously distended and convoluted. The stroma becomes progressively looser by imbibition of fluid and increase in intercellular fibrils, and a more compact cellular layer is formed just beneath the surface of the endometrium by concentration of the stromal cells. The individual cells of the stroma become larger and are the precursors of the decidual cells of pregnancy, the denser layer just beneath the surface becoming the decidua compacta, and the deeper less compact layer becoming the decidua spongiosa. From the twenty-fifth to the twenty-eighth days leukocytes appear in increasing numbers in the spongy layer and beginning degeneration is noted in the stromal cells.

About the twenty-eighth day the period of desquamation begins, disorganization occurs in the stroma, capillaries rupture, the tissue becomes infiltrated with leukocytes, the stromal cells degenerate, desquamation of the glandular epithelium takes place, and large portions of the endometrium are cast off with bleeding into the uterine cavity. Desquamation, autolysis and phagocytosis accomplish complete destruction of the functionalis so that about the third or fourth day after the beginning of menstruation only the basalis remains and the epithelium of the glands remaining in the basalis may be seen growing out to reinvest the uterine cavity.

By correlation of the facts heretofore enumerated it is concluded that the menstrual cycle is controlled by the ripening and ripened ovum. The ovum controls the growth and function of the granulosa cells of the follicle, which eventually form the corpus luteum, and these in turn control the course of events in the endometrium. Thus the ovum holds its mastery until it is no longer capable of fertilization and undergoes degeneration; the corpus luteum, freed of the influence of a living ovum, suffers regressive changes which are, in turn, followed by the changes in the endometrium leading up to menstruation.

The proliferation phase of the endometrium takes place only in the presence of a ripening follicle in the ovary, the secretion phase only in the presence of a corpus luteum in full function, and desquamation only in the presence of a degenerating corpus luteum, this last being coincident with menstruation.

DISCUSSION

Dr. H. A. Furlong (Pontiac): The subject has been very well covered by Dr. Alles. There is one point of interest here that in the last year we tried at the University Clinic. We first secured the impetus for this work from the work done at the Ford Hospital by Dr. Pratt in which I think Dr. Nelson participated.

There was an effort to settle the question of the relation between menstruation and ovulation by irrigation of the fallopian tube in an effort to secure the

ovum from the tube. We tried this in every case that came to the operating table, exclusive of inflammatory cases. The lower uterine cavity was closed off by the ordinary plan and the wall of the uterus pierced with an ordinary Wassermann needle, and a saline solution was injected into the cavity. The tubes were held over watch glasses and the debris washed out of the tubes very easily. We were successful in securing one specimen which we were quite sure was a fertilized ovum. That is now in the hands of Dr. Huber for further study.

A very interesting bit of work had been done previously and we had carried it on there. So the evidence now is pretty well established.

This has a great deal of importance in the treatment of sterility cases. So wide has become the use of the Rubin test that most everyone is now able to carry out these tests in his office. The results, however, have varied in direct proportion to the knowledge obtained by the man who is doing the work. The most successful time for doing the Rubin test has been found to be shortly following the menstruation so that there is present in the tube, at about the twelfth or fourteenth day following the onset of menstruation, live spermatozoa. At that time fertilization is most apt to occur.

The correlation between the ovulation and menstruation is of great clinical importance, something that cannot be forgotten.

Further, there is the extraction of the corpus luteum hormones in an effort to use those in clinical work, to stimulate various functions and to lessen the stimulation of other disturbed functions. I have in mind the use of corpus luteum in the onbringing of pregnancy. It is becoming a very widespread practice, one which I think should be lessened because we have not yet enough evidence to prove that the onbringing of pregnancy will be greatly affected by the use of the corpus luteum method. We cannot separate the psychical effect of such administrations and the actual result of the hormone.

In think until we have more evidence that they are of some value they should be used less widely than they are at the present time.

Dr. Lewis E. Daniels (Detroit): I would like to ask one question: Does Dr. Alles know of any reason why some women, following childbirth or pregnancy, begin to menstruate the first month, or in six weeks, while they are still nursing the baby and why others do not menstruate until about the sixth or seventh month?

Dr. R. W. Alles (closing discussion): My reason for bringing to you this paper was for its clinical information. I happened into a laboratory one day and in looking over the specimens removed at operation that day I saw two ovaries removed by different surgeons. One of them contained a ripe corpus luteum, the other one contained an almost ripe graafian follicle. Both of these had been removed and I could see no other macroscopic evidence of disease in the ovaries.

I held up the bottle to the pathologist and said, "This looks like a normal ovary to me and a corpus luteum."

"Yes," he said, "you are a good diagnostician."

"This looks like one with a graafian follicle. Why were they removed?"

"You answer that for me and I will answer it for you."

Then I went on, "What proportion of ovaries which you receive here are normal ovaries and what proportion have pathological evidence in them?"

"Over one-half of the ovaries submitted are perfectly normal ovaries."

It is probable that the surgeons remove the ovaries because of their belief that there is some pathology in them when they see a corpus luteum or a ripening graafian follicle; they think there is a cystic degeneration of the ovary.

Dr. Daniels' question is one which I hadn't anticipated and one which I think that he can answer just as well as I can. That is, that there probably is no ovulation. The reason why there is no ovulation I cannot say. The reason why no ovum develops to full maturity and no follicle ruptures I do not know and I do not believe anybody else does either. If menstruation takes place early following the delivery of a child it may mean that there has been early resumption of ovulation.

ADVANCES WORKING THEORY OF CAUSE OF CANCER

A tentative working theory of the cause of cancer was advanced at the Minneapolis meeting of the American College of Physicians by Dr. Leo Loeb of the Washington University School of Medicine. Dr. Loeb reviewed the present knowledge of cancer, which consists of a number of disconnected facts brought out by various investigators, and proposed his theory which attempts to construct from these facts a connected whole.

If the action of heredity is considered as sensitizing the substratum to the effect of various agencies which promote growth, it may be concluded that all the factors which cause cancer have in common the faculty of increasing the reproductive, growth-producing activity of cells, usually over a long period of time. It is this continued excess in reproductive activity in localized and often in sensitized cells which leads in the end to the cancerous changes, according to the theory suggested by Dr. Loeb.

"Thus we might tentatively attempt to construct out of more or less isolated facts a connected whole, a provisional theory," Dr. Loeb said. "This theory presumably will have to undergo many changes, but it will have served its purpose if it makes it easier for us for the time being to keep in mind and to understand many otherwise disconnected findings."—Science Service.

PLANTAR WARTS

CYRIL K. VALADE, M.D.†
DETROIT, MICHIGAN

Parents and guardians of school children in Detroit have been greatly alarmed during the past eighteen months. The cause of this hysteria is the increasing number of plantar warts which have affected those boys and girls taking gym and using the pools and showers. The health and school authorities are making every effort to stem the increasing number of infections. Because infection it is, proven by the fact that only those using the showers and gymnasium are suffering with this troublesome disease of the skin. Dr. W. H. Shipton of Detroit found, during his periodic examinations of school children, that in October and November, 1929, between three and four hundred boys and girls in his district alone had plantar warts. He called to the attention of the Board of Health the alarming proportions to which the infection had spread. Since that time their sanitary engineer, at the direction of a specially appointed dermatologist, has begun a scientific investigation as to the cause, result and prevention of this troublesome infection. Other investigations have shown that the places of contagion are the floors of the locker rooms, shower baths and swimming pools. The shoes are removed at the lockers and the students walk barefooted to the showers and pools, picking up the infection on the way. At a second examination, held in January, 1930, Dr. Shipton found that having eliminated children with plantar warts from swimming pools he had lowered the prevalence of this disease by 50 per cent. Another serious infection picked up from the floor of locker rooms and pools is the well known "athlete's foot" or, strictly speaking, epidermophytosis. The prevalence of the latter disease as estimated by various dermatologists is 60 per cent. In our experience this estimation is very conservative.

It is surprising how little is found in the reference books about the etiology of verruca plantaris. Consequently, the writer thought it worth while to review what *is* known about this very persistent disease.

THE ANATOMY OF THE WART

The wart[1] starts as a pinhead circular whitish elevation of flat epithelium. As this enlarges it goes deeper into the subcutaneous epithelium and the blood vessels of the rete papillæ project upward to supply it with blood, forming finger like projections, each with a central core of fibrous tissue and a blood vessel loop (explaining the bleeding points of a wart). In some cases the upward growth of the little tumor is most marked and in others the downward growth. If the end of a curette is pressed against the base of a fairly well developed wart of the free surface, it frequently may be tipped out of its bed and it is indeed surprising what a deep hole is left. The thicker and denser the epithelium of the location of the wart, the greater the depth the wart is capable of extending downward. In the thick epithelium of the plantar surface of the foot, warts may attain an extraordinary depth and this fact must be kept constantly in mind when treating them. For the same reason thev are deep on the palmar surface of the hands and about the nails, and these also are the only places, the soles, the palms and about the nails, where warts are painful and in these localities they may be extremely painful. The plantar lesions often resemble a callosity, are painful and interfere with walking. They occur most often on points of pressure, but may be scattered irregularly over the entire plantar surface. They are often single but may be numerous, especially in juveniles. (See photographs.) They are pea-sized or larger, usually covered with a horny plate and surrounded by a keratotic ring. The center is composed of the usual hypertrophied papillæ and is comparatively soft. The character of the lesion is often not seen until the horny plate is removed by treatment or bv the scalpel. The The lesions are persistent and very resistant to treatment.

†Dr. Cyril K. Valade graduated from Detroit College of Medicine and Surgery 1916. Post-Graduate work on Diseases of the Skin in London Hospitals. Studied syphilis with Harrison at Rochester Row Hospital, London, while a Lieutenant in the Royal Army Medical Corps. Member of the Military Surgeons of the U. S., American Legion, Major, Medical Reserve Corps of the U. S. Army. Instructor in Dermatology and Syphilology at the Detroit College of Medicine and Surgery and Receiving Hospital of Detroit. Assistant Dermatologist, Harper Hospital.

THE ETIOLOGY

From an etiological standpoint, many observers have given us convincing evidence, scientifically, of the infectibility of warts. Of course in all varieties of warts, age is the predisposing factor. Trauma, in the case of plantar warts, may be considered a predisposing factor. There is no doubt that the clinical history of warts very strongly suggests an infection. Every physician has ample evidence of the auto-inoculability and contagiousness of warts. Chavarri and Shipley[2] cultured a fungus from warts. Judassohn[3] produced warty lesions in 33 instances out of 74 inoculations in 6 adult patients, the incubation period being from seven weeks to three months. Similar observations have been made by other workers. Wile and Kingery[4] in 1925 produced typical lesions of verruca vulgaris both clinically and histologically by injecting intra-cutaneously a sterile filtrate of wart material. Since then Dr. Wile has produced lesions in the second generation. The incubation period in these cases was from four to seven weeks.

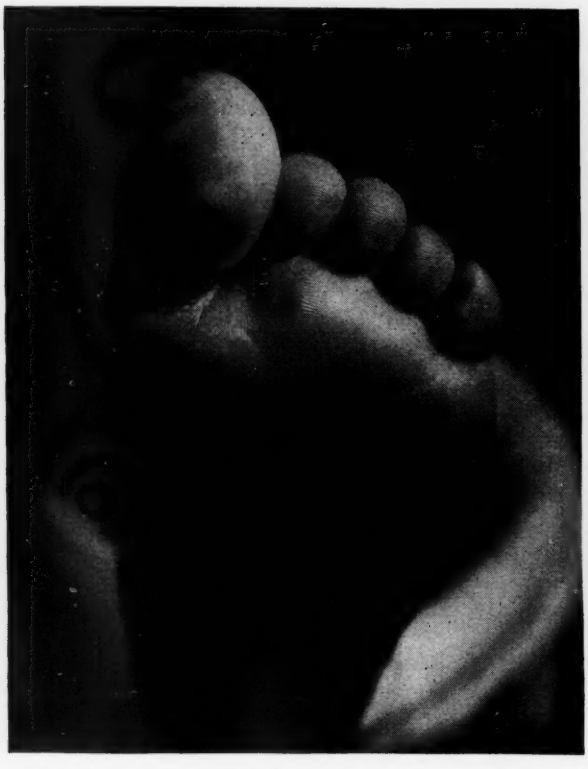


Fig. 1. I. F., school boy. Single wart, common site.

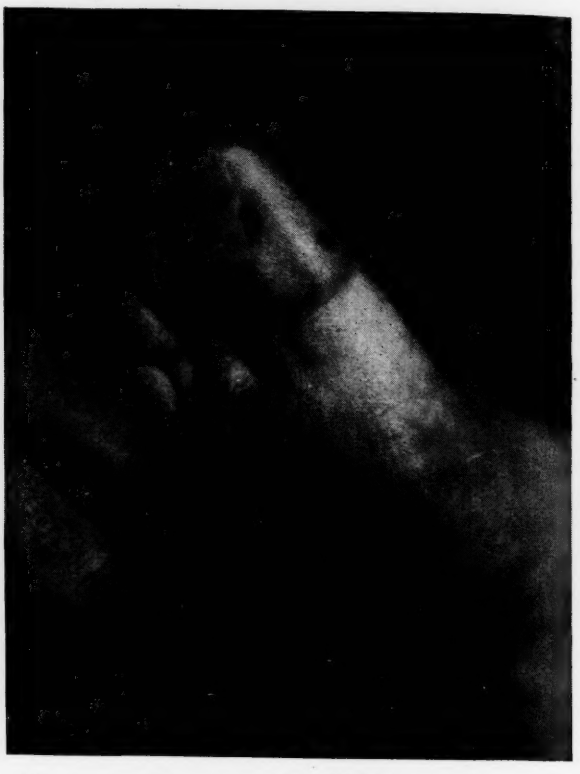


Fig. 2. H. K., school girl. Multiple warts, cured by X-ray.

THE SUPERSTITIONS

It is amusing to note that Dr. Bonjour[5] (Germany) believes warts are due to psychic causes and he claims that he cures them by suggestion in from one to five weeks. He goes still farther in his superstitious wanderings by stating that the other popular procedures act in the same way. This may explain one of the old beliefs that to rub a wart with a piece of candy, wrap the candy in a piece of paper and throw it over the left shoulder will cause a wart to disappear within 4 weeks. Another old superstition was to gaze at a new moon and, while gazing, pick up some dirt, rub the wart and toss the dirt over the left shoulder still looking at the moon. This was a sure cure. You can all recall people using a potato and the milk from a milkweed to accomplish the same result. Again some people believe that to touch a toad will cause warts.

THE DIAGNOSIS

Although plantar warts may be mistaken for callosities, the painful character of the former together with the typical appearance on removal of the horny covering, readily distinguishes the two. The infected wart, corn or callus may be confused with the "syphilitic corn"[6] or "mal perforans." Consequently, according to Stokes, the pupils of patients with an infected wart or callus should be examined with the possibility of tabes in mind. In addition the

Keratodermic tertiary syphilide[7] of the plantar surface may be mistaken for possible ringworm or calloses of this area.

THE PATHOLOGY OF WARTS

Ormsby noted[8] "that the chief changes histologically occur in the epidermis. The stratum corneum is greatly thickened. There is both hyperkeratosis and parakeratosis, as many cells still contain nuclei. The rete is thickened and marked down growth of the rete pegs (acanthosis) occurs. Mitoses are noted throughout its depth, particularly near the basal layer. The papillæ are elongated in proportion to down growth of the rete pegs, but otherwise normal. Some cellular infiltration is present in the corium, but is not a prominent feature. Some difference of opinion has existed as to the starting point of the process." It was found by Wile and Kingery[9] that the first changes were a localized acanthosis, confirming similar observations made by Unna and Auspitz.

Bowen[10] found peculiar epithelial cell degeneration in certain cells of the rete in plantar warts.

THE TREATMENT

The treatment for plantar warts may be divided into three methods.

1. Local applications of plasters or pastes containing keratolytic drugs, the most popular one being salicylic acid. Markley's[11] method is the best of this class and is as follows:

He surrounds the area with simple collodion to protect normal tissue from continuous action of drugs. The thickened epidermis is cauterized with fuming nitric acid or strong solution of caustic soda until the callosity has been eaten away to the depth at which patient first complained of pain. The hole formed is filled with a 15 to 20 per cent salicylic acid ointment. This is covered by a felt corn plaster of nearly 3 inches in diameter having an aperture of about 1 inch. The crater is filled, after scraping the detritis gently away, every morning. It requires 7 to 8 days for cure.

2. The second method is by surgical diathermy. You can use either the monopolar or bipolar electrode. Some like the indirect method, that is having the patient hold the electrode, then use a pencil or applicator for directing the spark from the patient. The surgical diathermy procedure is practically painless if the operator has injected a local anesthetic skillfully (we have found 2 per cent novocaine combined with a solution of adrenalin very satisfactory for this type of local anesthesia).

3. The third method is by radiation. The chief objection to methods one and two is the constant danger of infection. The location of plantar warts is very favorable for infection after any surgical procedure if the patient is permitted to go about his daily activities. If the patient can be put to bed, why of course this danger is practically eliminated. X-ray therapy for plantar warts is perfectly safe at the hands of an operator who is trained in roentgenology. The procedure is simple. The surrounding skin is screened to the edge of the lesion with the usual lead-rubber screen. Place target at right angle to wart at the required distance for whatever dosage is required, then run the machine for the necessary time interval. The unfiltered dose is used. For the exact technic for measuring X-ray doses we refer you to MacKee's book "X-rays and Radium in The Treatment of Diseases of the Skin." The dose necessary for the average wart is one and one-half skin units (MacKee's designation). This depends of course upon the amount of callosity present. If there is much horny tissue it may require two or more skin units of X-ray at one dose. If the wart has not disappeared by four weeks it is safe to give another treatment. If this is insufficient it is better to apply method number two. It is very satisfying to report that failures in the use of X-rays are few.

EFFECT OF X-RAY TREATMENTS

Hazen and Eickenlaub[12] —16 patients, 15 cured. Treatments ranged from 1 to 7. Dose 1⅓ S. U. No recurrences.

MacKee[13]—treated 60 patients, 30 final results known. 20 were cured, 4 improved, 6 failures. Six cured—1 treatment, 1st dose 1 to 1¼ S. U. (Unfiltered). 2nd dose 2 S. U.

Fox[14]—reported that he cured 6 out of 9. Average number of doses 2. Total average dose 2¾ S. U.

Nancel-Pinard[15]—used X-ray treatment since 1907. Began using small dose, later larger, all unfiltered. 1½ to 1¾ units according to MacKee's designation.

Jeffrey C. Michael,[16] Houston, Texas, has had 90 per cent cures using X-ray. (In one case used as high as 2 to 2½ S. U.)

Using 1¾ S. U. and not removing hyperkeratosis—66 per cent cures.

Radium also has been used with about the same results experienced with X-rays. The flat application is the most popular method of applying radium. A half strength flat glazed element, application screened with 0.1 mm. aluminum, in contact with wart for 15 to 30 minutes or even longer if there is much hyperkeratosis.

REFERENCES

1. Verruca—Douglas W. Montgomery and George D. Culver: Archives of Dermatology and Syphilology, 10:425 (October, 1924).
2. Warts—A. P. Chavarri and P. G. Shipley: Bulletin Johns Hopkins Hospital, 41:11 (July, 1927).
3. Verband—der V. Deutschen Cong., 1896, p. 497.
4. Journal American Medical Assn., 1919, p. 970.
5. Warts—Bonjour: Schweiz. Med. Wchnschr., 54:748 (Aug. 14, 1924).
6. Stokes "Modern Clinical Syphilology," 2nd Edit. p. 677.
7. Loc. cit.
8. Ormsby: "Diseases of the Skin" (3rd Edit.), p. 506.
9. Loc. cit.
10. Brit. Jour. Derm., 1890, Vol. 2, p. 199.
11. Treatment of Warts of Foot. U. S. Nav. Med. Bull., 23:141 (Aug., 1925).
12. Hazen and Eichenlaub: Jour. Amer. Med. Assn., 1920, Vol. 74, p. 1311. The Roentgen-ray Treatment of Verruca Plantaris.
13. MacKee: X-rays and Radium in the Treatment of Diseases of the Skin.
14. Fox, H.: The Roentgen-ray in the Treatment of Skin Diseases. Archives of Dermatology and Syphilology, 9:13 (1924).
15. Nancel-Pinard, M.: Note sur le traitment des Verrues Plantaires par la radiotherapie. Bull. Soc. franc de dermat. et syph., p. 280 (1921).
16. Michael: Archives of Dermatology and Syphilology, 1926, 13:658. Roentgen-ray Treatment of Verruca Plantaris.

MICHIGAN'S DEPARTMENT OF HEALTH

C. C. SLEMONS, M.D., Commissioner

LANSING, MICHIGAN

RESORT SANITATION

The summer of 1929 was the first season in which an attempt has been made to cover the entire state on resort inspection. Records of previous inspections and published lists of resorts were the only available basis for an estimate of the number of men necessary to reach all of the resorts of the state during the two months that they are open. The laying out of districts and itineraries was therefore very largely a matter of guesswork. The total of all known resorts at the beginning of the season was less than half of those actually found and inspected.

Six men made up the staff of resort inspectors, and the state was divided into six districts on the basis of known resorts. Work started July 1 and was finished between August 28 and September 7. A few days at the beginning of the program were given over to instruction of the men. This included instruction by two dairy inspectors from the Department of Agriculture in methods of inspecting and rating sources of milk supply.

A special resort blank was prepared to be filled out in the field. Instructions for improvements were given by the inspectors while on the ground whenever this could be done, and a stock of bulletins for distribution was carried by each inspector. Problems requiring engineering design and specialized advice were referred to the office. A report was mailed to the resort owner or manager from the office, giving the rating of the resort. It appeared to be more satisfactory to express the rating in percentage form than by letters. Owing to the press of work in the office, the 1929 ratings were not mailed as early as they should have been. Arrangements have been made for 1930 whereby it is expected that the ratings will go out within a week or two after the inspections are made.

It was found during 1929, as in previous years, that the resort proprietors and managers welcomed the inspections and were very willing to coöperate in making any changes suggested. The educational value of the work was high. Many owners had not known that advice and service are available without cost from the State Department of Health.

It was the opinion of the inspectors that strictly resort hotels should be inspected by the resort inspectors because it is doubtful if the hotel inspectors reach such hotels. An effort will be made to determine more fully just what should be done in this respect without running the risk of duplication of inspections.

It appears that only a relatively small proportion of resort food handlers have had physical examinations, and it was suggested by the inspectors that this activity should be extended if possible.

Reinspection of resorts shows very definite improvement. One inspector reported 57

reinspections. At these places he had recommended 167 changes. Upon reinspection he found that 132 changes had been completely complied with and 18 partially complied with. In many of the cases where nothing had been done, the requirements were of such a nature that the improvements could not be made during the resort season.

Some of the inspectors reported the need for definite information to give out at bathing beaches regarding the satisfactory methods of disinfecting bathing suits. An effort will be made to furnish some reliable information on this subject during the 1930 inspections.

A comparison of inspections since resort work was begun in Michigan is as follows:

Year	Resorts	Countries
1913	77	11
1916	173	29
1917	48	15
1920	59	12
1921	134	10
1922	152	15
1928	225	24
1929	1663	68

E. D. R.

THE TRAINING STATION

The class of seven health officers and public health nurses that started work in the Training Station May 15 has been spending two weeks in the field, working with the Midland County Health Department. Lectures in the State Department of Health offices will begin as soon as the preliminary field trip ends. The whole course will occupy 13 weeks, with field work beginning and ending the course.

An interesting addition to the class will be the arrival, at varying times and for varying periods, of seven fellows of the Rockefeller Foundation. These men are assigned by the Foundation to receive practical experience in well organized and well conducted health departments before returning to their respective countries.

The group of fellows is to be made up of Dr. Selaheddin Bedri, Health Officer, Ministry of Public Health, Turkey; Dr. Victor W. Fenn, Assistant Bacteriologist, Harcourt Butler Institute of Public Health, Burma, India; Dr. Luigi Gabbano, Assistant Institute of Hygiene, Royal University of Genoa; Dr. Tahsin Sevket, Assistant in the Hospital Numune, Angora, Turkey; Dr. Krishnan Tampi, Health Officer of Trivandrum, India; Dr. P. G. G. Unnithan, Rural Sanitation Officer, Madras, India; and Dr. G. S. Escoffery, Medical Director of Unit of the Hookworm Commission, Mandeville, Jamaica. All of these men have been studying at Johns Hopkins University for the past year.

QUADRUPLETS

The recent birth of quadruplets, all living, occurred at the Sparrow Hospital in Lansing. The birth of quadruplets is so exceptional as to create a good deal of comment and interest.

Plural births are not uncommon. In the past three years, in a total of 295,691 births in Michigan, there were 2,218 sets of twins and 27 sets of triplets. This is equivalent to one set of twins to 131 single births and one set of triplets to 10,785 births.

Michigan Department of Health records do not show the previous birth of quadruplets in this state, within the years for which this type of record is available. It is stated, however, in literature that there is one set of quadruplets approximately to 370,000 births. If this estimate is correct we would expect five or six sets of quadruplets to be born in the United States each year.

The very interesting part of the Lansing case is the fact that all of the children were born alive and at the time of this writing, May 24, are still living.

W. J. V. D.

CHILD HYGIENE ACTIVITIES

The study of births survived by the mother, planned to supplement the recently completed study of maternal deaths, is progressing rapidly. Already records have been secured on 263 cases. Both Dr. Knowlton and Dr. Alexander are working on the study, Dr. Alexander interviewing physicians in the Upper Peninsula, and Dr. Knowlton in the northern part of the Lower Peninsula.

The Mason County demonstration program of prenatal, infant, and preschool child nursing is well under way, with Sylvia Krejci, R.N., in charge. Kalamazoo County is having the same type of program, carried on by Nelle Lemmer, R.N.

Esther Nash, R.N., and Charlotte Ludington, R.N., are still in St. Clair County, assisting in the diphtheria prevention campaign. All of the clinical work is being done by local physicians. Payment is being made in various ways, in some cases by the

individuals immunized and in other districts by local agencies.

Ottawa County has the services of Caroline Hollenbeck, R.N., who is doing prenatal and infant nursing.

Annette Fox, R.N., and Julia Clock, R.N., are assisting Dr. Murphy in diphtheria immunization in Chippewa County.

Child Care Classes in Tuscola County, conducted by Bertha Cooper, R.N., are just being completed.

THE PLUMBING CODE

The proposed state plumbing code is now finished so far as the Code Committee is concerned. A meeting was held in Detroit on May 9 at which a committee of fifteen representing the building trades was chosen and given authority to confer with the Michigan Department of Health on points still in conflict. The tentative date of May 29 has been set for the meeting of that committee with the Code Committee, and it is hoped that final agreement can be reached at that time.

DIPHTHERIA IMMUNIZATION IN CHIPPEWA COUNTY

At the request of the Chippewa County Medical Society, a physician from the Bureau of Preventive Medicine of the Michigan Department of Health was assigned to that county to assist in a diphtheria immunization program. Dr. W. J. Murphy has been in the county for the past three weeks, working especially in the rural sections.

PURE WATER AND TEMPERANCE

We pride ourselves on our advancing civilization and intellectual superiority, writes Dr. William J. Mayo. If we are to continue to advance, the public health service must be made the first function of the state. It is probable that neither prohibition propaganda nor an appeal to the conscience of man has caused the rapid advance of the temperance movement, but that pure water has made it possible. It is assumed that the drinking of spirituous and fermented liquors is due to an evil inborn longing, to be stamped out only by the exercise of individual self control. Is this true? In France and Italy the drinking of billions of gallons of wine saved the people from extinction; they could not have lived had they drunk their polluted water. The Teutonic countries turned to beer to secure a sterile drink; England had ale and wine, and temperance countries, such as Turkey, had tea and coffee. Simultaneously with Vienna's introduction of a pure water supply from the mountains, her per capita consumption of spirituous and fermented liquor was reduced 40 per cent. The introduction of a pure water supply in the various states in our own country has been followed by a temperance movement, and finally by prohibition. The drink habit is one of the many forms of individual protection resorted to by nature to save man from filth diseases which cause death, or that which is worse than death, intellectual deterioration. As pure water is introduced into the countries of Europe a temperance movement is at once manifest.—From Vol. XXI, Mayo Clinic.

GUARDIANS OF HEALTH

The members of the American Medical Association, whose eighty-first annual meeting opened in Detroit June 23rd, are in a sense the keepers of the nation's health. The importance of this trust may be judged from the fact that one authority places the cost of illness to the United States at $15,000,000,000 a year. Another has discovered that the popularly supposed inconsequential cold in the head alone takes a billion dollars out of the pockets of the United States and Canada annually. The doctors do not get all of the $15,000,000,000. A large share of it represents the loss of wages through sickness, which bears heavily on the economic life of the country.

The annual illness bill the American people has to foot is appalling; but it would be far more staggering if it were not for the unceasing war on disease that the medical profession has waged for centuries. The present state of medical knowledge has been attained by sacrifices which, if less spectacular than those of the battlefield, were far more noble. They aimed to save life instead of to destroy it. Surgeons and physicians have had to contend with both secular ignorance and religious prejudices. They were obstructed in their early attempts to reduce infantile and maternal mortality by the Genesic idea that the agonies of childbirth were a God-sent punishment for Eve's disobedience. Our own colonial ancestors thanked God for sending smallpox into their families to try them! A hundred years ago medical schools in this country and Great Britain had to depend largely on rifled graves for the anatomical material with which to teach surgery.

Against all these handicaps and obstructions the medical profession has had to wrestle. Superstition and ignorance and indifference to health matters have not altogether disappeared. This should be remembered in attempting to measure the achievements of the medical profession in terms of national health. There is no virtue or compliment in welcoming the doctor when one is ill; but it is both a pleasure and a compliment to welcome him when one is enjoying the best of health, as Detroit does today.—*The Detroit Free Press.*

THE JOURNAL

OF THE

Michigan State Medical Society

PUBLICATION COMMITTEE

J. D. BRUCE, M.D., Chairman.....Ann Arbor
JULIUS POWERS, M.D.....Saginaw
B. H. VAN LEUVEN, M.D.....Petoskey

Editor
J. H. DEMPSTER, B.A., M.D.
641 David Whitney Bldg., Detroit, Michigan.

Business Manager and Editor County Society Activities
FREDERICK C. WARNSHUIS, M.D., D.Sc.
2429 University Avenue, St. Paul, Minnesota, and
Grand Rapids, Michigan.

All communications relative to exchanges, books for review, manuscripts, should be addressed to J. H. Dempster, M.D., 641 David Whitney Bldg., Detroit, Michigan.

Reprints of papers published will be furnished authors at cost if the order is placed at the time the galley proofs are returned to the editor. The cost of illustrations is to be defrayed by the author of the paper whether reprints are ordered or not.

Contributors are responsible for all statements, conclusions and methods in presenting their subjects. Their views may or may not be in agreement with those of the editor. The aim, however, is to allow authors as great latitude as the general policy of The Journal and the demands on its space may permit. The right to reduce in length or to reject any articles is reserved. Articles are accepted for publication on condition that they are contributed solely to this Journal.

All communications regarding advertising and subscriptions should be addressed to F. C. Warnshuis, M.D., 2429 University Avenue, St. Paul, Minnesota, or Suite 1508 Grand Rapids National Bank Bldg., Grand Rapids, Michigan.

JULY, 1930

"I hold every man a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves, by way of amends, to be a help and ornament thereunto."

—*Francis Bacon.*

EDITORIAL

MEDICAL HISTORY OF MICHIGAN

Those who have subscribed for the Medical History of Michigan have received Volume 1. Considering the immense amount of work in completing this volume even after the copy was in the hands of the printer, the publisher as well as Editor Burr is to be congratulated. There is an immense amount of proof reading and indexing in an eight hundred page book. Proofs need to be revised several times in order to insure a proof perfect volume.

An excellent review of this work by Dr. J. B. Jackson, president of the Michigan State Medical Society at the time the idea of a medical history was conceived, appears in this Journal so we will not make any extended comment on the volume itself further than saying that it is a credit to both the editor and author as well as the publishers. Every doctor in the state of Michigan should number this set among the volumes of his library. He may be one of the older physicians who has been a spectator of many of the events recorded as they occurred during his lifetime, or he may be one of the younger men who has been in practice only a few years to whom the History of Medicine in Michigan is an entirely new and to the present moment a closed volume. Both will find this work of interest and value. A medical history is the only work in the doctor's library that does not need revision every five years. A work on medicine or surgery is old in five years, obsolete in ten and ancient in fifteen. The data of medical history are of perennial freshness. If you have not already subscribed for these two volumes, send your check for $10.00 immediately to the secretary of the Michigan State Medical Society.

The second volume is practically in type and will be ready for distribution early next fall. The publisher is the J. R. Bruce Publishing Company of Saint Paul, Minnesota, also the printers of this Journal.

POST-GRADUATE MEDICINE

The third annual post-graduate course given by the Department of Post-Graduate Medicine of the University of Michigan was held in Detroit at the Receiving, Harper, Children's, Grace, Herman Kiefer and St. Mary's Hospitals, June 2 to June 21 inclusive. The general division into internal medicine and surgery was observed. Practically every special field was included but the object was to deal more or less exhaustively with special subjects such as goitre, endocarditis and diabetes, rather than attempt a systematic course in cardiology or constitutional diseases. All hospitals furnished an abundance of illustrative cases. The clinical work consisted of the small bedside group, though the demand for this work has become such that the groups as witnessed by the writer were about as large as could be well accommodated.

Post-graduate instruction in the medical sciences has become an established institution in this state due in no small measure to the foresight and the untiring efforts of Dr. J. D. Bruce, Director of the Department of Post-Graduate Medicine of the University of Michigan. There is no better way to

combat cultism than through scientific preparation for his work on the part of the regular practitioner.

THE AMERICAL MEDICAL ASSOCIATION

The great national organization of American physicians and surgeons has just closed its annual convention in Detroit. This is the second time within less than a quarter of a century that this state and particularly Wayne County has been the hosts of the national organization. Since the meeting here in 1916 medical science has progressed more rapidly than any other similar period in its history. The irresistible trend towards specialization is seen in the fact that at the Detroit meeting there were fifteen scientific sections representing the specialized departments of mdicine and surgery. Over three hundred papers were presented, making readily available to all interested the results of the past year's study and research.

A noteworthy feature of the national convention was the scientific exhibit where visual education was a very commendable factor. Someone has said that one picture or specimen is worth a thousand words. The scientific exhibit at the Detroit session represented perhaps the most complete feature of its kind in the history of the Association as there were over one hundred and fifty exhibits and demonstrations. Among these were group exhibits on varicose veins, biochemical methods, fractures, besides demonstrations by many of America's noted pathologists. The attendance at this feature of the Association's program was large and constant.

The attendance at the annual meetings makes it evident that the medical profession look upon this as the outstanding medical event of the year. Its central location made it possible for a large attendance at Detroit. The committee on arrangements representing the Wayne County Medical Society are to be congratulated on the rôle of host it was called upon to fill. Nothing was wanting to make the event a success from the social as well as scientifically profitable viewpoint.

CHRONIC CONSTIPATION

The very interesting dissertation on physiologic considerations in the treatment of chronic constipation which constitutes the first article of this number of the Journal of the Michigan State Medical Society, was presented over a year ago at a joint meeting of the American Proctologic Society and the Wayne County Medical Society. As it appears here it has been thoroughly revised and represents the author's position at the present time. Dr. Bastedo is one of the leading proctologists in this country and author of a well known treatise on the subject. The paper it is our good fortune to present to our readers is virtually a small monograph on the subject. It gives in comparatively small compass a subject which has a voluminous literature and the presentation is by a master.

In addition to a discussion of the physiology of the colon we have a presentation of the pharmacology of drugs and other agents that are commonly used in the treatment of the often stubborn condition—chronic constipation.

The subject should have a broad appeal, including the surgeon in the various specialties as well as the internist. Often desirable results in the treatment of specific conditions are retarded or impossible while chronic constipation persists.

ONE LICENSING BOARD

Often those outside a particular profession are in a better position to discern its merits and shortcomings than the members themselves. Not infrequently have reforms resulted from criticism and suggestions from those who from a distance are in a better position to judge than those, so to speak, in the very midst. The high standards of medical education, however, have been achieved largely from within the ranks of medicine. Now comes the suggestion that since education in medicine, law, engineering, pedagogy, have come to be recognized as a state function and that in two of these at least the state reserves the power to grant license to practice, why not the entire power to grant such licenses be vested in some such body as the state University, the department of public instruction or state board of education or a committee consisting of school superintendents—any one of these organizations would be neutral as to the methods of practice, competent to pass upon educational qualifications and should be glad to help in safeguarding the interests of the public. Surely the matter of care of the sick is as important as the education of

the youth of the land. The state University, Michigan State College as well as important colleges not dependent on state aid are governed by high grade laymen; they have proved themselves so efficient in the conduct of our major educational institutions that they might be entrusted with the entire function of granting or withholding license to practice as in the case of the teaching profession. Teaching, medicine and the other professions have become so largely scientific that the licensing function could be performed very satisfactorily by a commission or board of the same standard, for example, as the board of regents of the state University. Such a movement would eliminate faddism in the various professions. As a profession we should not lightly dismiss the suggestion that all candidates for admission to the callings which are concerned with the health of the people, and this includes all the so-called healing cults, be placed under such lay control as suggested. Preventive medicine is already under state control with the coöperation of the private physician. Let us not be misunderstood, the proposition has not the remotest relation to "state" medicine so-called.

OURSEL'S AS ITHERS SEE US*

A prominent English psychiatrist visited the United States some time since and returning to his native land wrote down his impressions of psychiatry in this country. In the first place he notes that there is no federal unity or that there is a total lack of coördinating of psychiatric arrangements among the different states of the union or the provinces of Canada. The nearest approach to any unifying organization is the National Committees of Mental Hygiene, unofficial bodies financed largely from voluntary sources. The writer avows that the purpose of his visit to America was to see all that was best and most interesting. In the parts of the United States visited he saw, "an amount of psychiatric research in progress that could not possibly be equalled in a similar tour of Great Britain." The writer noted four main factors which constituted the outstanding differences in psychiatry in America as compared with that of England. The first is the enormous growth of population, which meant that institutional provision for mental disorder tended to be inadequate. This shortage was not an unmitigated evil for it resulted in extra-mural activities on the part of State hospitals and State schools. Of course the condition of shortage of Institutional provision for the mentally defective led to an over-crowding, to incarceration in jails and very frequently to premature discharge of patients simply to make room for others.

The second feature noted was the extent to which official provision at public expense is supplemented by bequests, donations from such sources as the Commonwealth Fund and the Rockefeller Foundation.

The third observation that the visitor makes is the degree to which "the American psychiatrist is master in his own house—a degree which is unthinkable in our lawyer-ridden land [England]." The replacement of the static mind of the lawyer by expert knowledge and the experimental spirit is, in the opinion of this English psychiatrist, the great guarantee of the future of America. He speaks in particular of the Recorder's Court of Detroit, where a complete psychopathic clinic has been recognized and employed by the Judges of the Court for opinion as to responsibility of the alleged culprit before trial, and after verdict but before sentence, as to which it should be, a commitment to prison or reformatory and for how long, or whether on the other hand the accused should be placed on probation with supervision. Judge Frank Murphy of the Recorder's Court, Detroit, states that he has found the psychiatric clinic invaluable as a guide in the disposing of cases that come before him. It would seem that abstract justice will be more nearly achieved when judges seek that knowledge which is to be had from cultured disinterested groups no matter what the subject under litigation.

Our psychiatric visitor is of the opinion that there is a far wider diffusion and a much higher level of psychiatric education here than in his own country, with the result that there is a greater tendency in the United States to look upon mental disorder as a problem to be solved rather than a burden to be borne. Regarding undergraduate instruction in psychiatry he claims that there is no university or medical school in England which approaches in thoroughness that which is universal in at least ten American universities.

*Impressions of Psychiatry in America by Edward Mapother, M.D., F.R.C.P., London, *The London Lancet*, April 19, 1930.

CANCER "CURES"

The announcement that Drs. Coffey and Humber of San Francisco have been treating persons suffering from malignancy by injecting a glandular extract presumed to have deleterious affect on cancer tissue, has resulted in thousands of communications and numerous visits of sufferers to the offices of these western surgeons. Before the Senate Commerce Committee at Washington, Drs. Coffey and Humber declared that more than 1,300 persons suffering from the last stages of presumably incurable cancer have been subjects of their experimentation. They insist that their work is purely experimental; that it is based upon a study of the sympathetic nervous system and the ductless glands in an effort to find a stabilizer of tissue growth.

Of the 1,300 persons receiving the treatment during the past three years, only 15 are reported to have died. The attitude of these two western surgeons is commendable inasmuch as there has been no attempt on their part to commercialize their work. Neither doctor has accepted any fee for the injections and neither has promised results. Both have discouraged patients who would be willing to travel across the continent as the subjects of experimentation.

Probably there is no other pathological condition in which the laity have become more "disease conscious." Neither pneumonia, appendicitis, nor any other disease condition is feared to the same extent as malignancy. In all other conditions the victim feels that there is left at least a fighting chance. In the case of malignant disease he grasps at the straws of promise without the least critical attitude towards the source. This condition of mind has rendered the treatment of malignancy a fruitful field for quackery throughout the centuries. It behooves scientific medicine to be very careful in the matter of weighing claims of suggested forms of treatment.

The cautious scientist, says Dr. Francis Carter Wood, referring to the Coffey-Humber treatment, asks, since we all have adrenals which give off a chemical substance to the blood, why should cancer ever develop if this substance has a curative effect? It is strange that cancer should grow in the adrenals whence this "healing substance" is derived. All attempts so far to find a cure for cancer have failed. "The reason for this failure," according to Dr. Wood, "is that the human being suffering from cancer has a disease in which the growing tumor is composed of cells from his own body, and hence these cells are perfectly adapted to the situation and are quite equivalent in many cases to the structures from which they arise. To destroy that tumor by serum or gland extract means that one runs the risk of destroying the healthy cells in the body. This is just what is observed."

ILLUSTRATIONS

The attention of prospective contributors has been called to the matter of illustrative material for their papers. Let us repeat, it is impossible to reproduce anything in color in the process of half-tone copper etchings such as used in the Journal of the Michigan State Medical Society. Sometimes line drawings and charts are submitted which are approximately eight by ten inches or larger; when an illustration of such size is reduced to single column width, the lines and other points are so much reduced as to be not much more than visible. Radiographs unless particularly well made should not be used. A positive print contains less detail than the original radiograph. The reduced cut from the print is apt to show much less, unless the X-ray negative is particularly good to start with. Attention is called to the conditions pertaining to the publishing of illustrative material, see title page of the Journal.

GOOD ADVICE

If you have a thing to say,
Cut it down!
Something you must write to-day,
Cut it down.
Let your words be short and few,
Aim to make them clear and true,
Monosyllables will do.
Cut it down!

Are you writing to the press?
Cut it down!
Make it half or even less,
Cut it down!
Editors like pithy prose,
Lengthy letters are their foes,
Take a hint from "One Who Knows."
Cut it down.

—Grenville Kleiser in the Paris Herald.

ROBERT BRIDGES

(LONDON LANCET)

The death of Robert Bridges, physician and poet-laureate, at the age of 85, brought to an end an interesting career—especially interesting because the finest flower of his intellectual achievement did not blossom until his last year. An uninformed reading of his life would lead to the idea that he

drifted from medicine because he was unfitted for its pursuit, and that when he discovered his métier as poet he was too aloof and too severely artistic to be the interpreter of ideals which would inspire a work-a-day world. Robert Bridges, as a matter of fact, was a successful physician before he allowed the influence of classical studies at Eton and Oxford, and the urge, gradually growing in intensity, of poetic production, to detach him from our ranks. And although much of his poetry was directed to an audience composed of the highly educated, and even of the severely cultivated, neither its melody nor its teaching asked for any extraordinary intellectual grasp from the reader. And the fervour and patriotism of his singing was slowly making appeal to an increasing number of readers when last year he published the lovely "Testament of Beauty," wherein deep religious feeling was blended with the humanism of medicine and a knowledge of its fundamentals. In Robert Bridges all medicine had a great colleague, and its followers may well regret that his long life is closed.

[The Late Poet-Laureate of England was called to Ann Arbor, where he lived a year under the late President Burton's term as president.—Editor.]

LORD BALFOUR ON GROWING OLD

(MANCHESTER GUARDIAN)

In the light of his achievements during recent years it is interesting to recall today the terms in which Lord Balfour announced his resignation of the leadership of his party in 1911. He wished, he said, to leave that position of heavy responsibility before he could be "suspected of suffering from the most insidious of all diseases, the disease which comes upon those who, without losing their health or their intellect, nevertheless get somewhat petrified in the old courses which they have pursued, whose authority grows because they have been long in the public service, or have been great men of science or business or whatever it may be, but who cannot deal with the great problems which in this changing world are perpetually arising with all the freshness and elasticity really desirable in those who have to conduct great concerns."

He added that no man ever knew in himself when that moment had come. The sort of malady of which he was speaking might attack people who were in the prime of life and of intellectual vigour as long as the intellectual vigour was exercised along the old lines, but who nevertheless were less capable of adapting themselves to the changing circumstances of life than those who were of less authority because younger, and yet were more capable also because younger. "I am vain enough to hope," he said "though no man can tell, that I have not yet reached that period, but I should be miserable if I ran the margin fine."

STATE MEDICINE NOT POPULAR

(THE NEW YORK TIMES)

At the closing session of the meeting of the American College of Surgeons in Chicago, Dr. Glenn Frank, president of the University of Wisconsin, told the assembled doctors that education of the public to a program of disease prevention is the outstanding need of the profession at present, asserted that otherwise agencies, such as insurance companies, industrial concerns, and even the government, may "step in and eliminate the private practitioner," and affirmed that the medical profession "must change the American mind so that the private doctor will be consulted at regular intervals in a sickness prevention program."

Just how any outside agency in this or any other country is going to "eliminate the private practitioner" without plunging society into the hopelessly undefended condition in the face of disease, which it occupied a century or two ago before the rise of modern medicine, we must leave Dr. Frank to imagine. The idea that government in this country will ever take up the control and practice of medicine is rather grotesque. State socialism may be popular in Wisconsin, but elsewhere it isn't.

As for the rest, who else but the physicians and surgeons of America have for years been pleading with members of the lay public to submit to periodical physical examinations, particularly after reaching middle age? Who but the doctors have warned against neglect of illness, have emphasized the importance of early treatment, and in season and out of season had told patients and public that the wages of self-neglect is suffering and death? Who have preached the gospel of clean, temperate living and rational habits, who else but the men and women with M.D. after their names?

The intimation by President Frank that modern doctors as a whole are indifferent to their opportunities and responsibilities to society, seems to us uncalled for and unjust. It is true that a doctor cannot insist too far. If he does, he at once lays himself open to a charge that he is "drumming up trade" and capitalizing the fears of patients. He has to be careful. About all he can do in many instances is to present facts, and leave the rest to the good sense of the layman. And that is all he is in any way morally bound to do.

WHY PATIENTS COMPLAIN

(OHIO STATE MEDICAL JOURNAL)

Rene Pnaux, French journalist, following a recent visit to America, wrote several articles setting forth his impressions of the New World, which he termed a "country in the making" and "in the full crisis of growing, with all the exaggerations and worries of adolescence."

One observation made by Pnaux seems to sum up the economic situation faced by America, as he sees it at least, and deserves consideration by those who are interested in and attempting to solve some of the economic and social problems of the period.

"I was somewhat horrified at the present methods of existence of a countless number of Americans who buy anything and everything on credit; looking for the morrow to bring in the dollars that they have spent the day before, accustomed to the idea that it is normal not to deprive themselves of anything," writes the French fourth-estater.

"This doctrine of 'living well' has determined the continual rise of salaries, and the corresponding increase of the cost of living, the social inflation which is just as dangerous as the financial inflation," he added.

In other words, Pnaux believes that Americans are living beyond their means and therefore violating a fundamental principle of sound economics.

The physician sees evidence of this "social inflation" daily in his care of the sick and injured. Any practitioner numbers among his patients those who ride in expensive automobiles; listen to costly radios; expect high-priced hospital rooms and specialized medical service, and attire themselves in the most expensive garments, demand all the "extras" and luxuries, but who protest vigorously when confronted with a moderate bill for medical, surgical and hospital services.

Countless Americans have as yet failed to recognize the difference between the luxuries and necessities of life. There is little hope of solving the so-called problem of cost of medical care, until the public begins to realize that medical service is one of the necessities of life and that every family must prepare to pay for it on the same basis as it pays for its other necessities and customary comforts.

SOCIETY ACTIVITY

ANNUAL MEETING

Our annual meeting will be held in Benton Harbor, September 15-16-17. The August Journal will contain the preliminary program and feature announcements.

MINUTES OF THE MEETING OF THE JOINT COMMITTEE ON PUBLIC EDUCATION HELD AT THE

Michigan Union, Ann Arbor, Friday, May 16, 1930, 12:15 P. M.

This meeting was held in conjunction with a special meeting of the Medical Society, including the Medical Council. The following members of the Joint Committee and guests were present: Drs. Warnshuis, Dempster, Lyons, W. R. Davis, Huber, Sundwall, Bruce, Henderson, Isaminger, MacCracken, Stapleton, Ricker of Cadillac, Boys and Crum of Kalamazoo, Corbus of Grand Rapids, Stone of Battle Creek, and Sawyer of Hillsdale, Miss Emilie Sargent representing the Nurses Association, and Miss Lera B. Curtis representing the Department of Public Instruction.

1. Report of the minutes of the last meeting.

2. Report of the Secretary. Mr. Henderson gave, first, a brief account of the health education activities up to date, the following tentative report regarding health lectures being included:

Number of schools taking part	106
Number of doctors and dentists taking part in the program (134+30)	164
Total number of lectures given before high school assemblies	476
Total number of lectures given to P. T. A's and other organizations	102
Approximate number in attendance upon lectures (140,600+14,016)	154,616
Number of different high school students	30,000

Second, he called attention to the Joint Committee Trust Fund, which is deposited with the Treasurer of the University. It was suggested that this fund be made available for such Joint Committee activities as might arise, withdrawals from the fund being subject to requisition of the Secretary of the Joint Committee. On motion of Dr. Warnshuis the Secretary of the Joint Committee was authorized to draw upon the Trust Fund for such Joint Committee purposes as might be deemed desirable.

Third, it was pointed out that there was a discrepancy between the statements made in the bulletin regarding traveling expenses incurred by members of the Medical Society, and the rules governing the payment of these expenses as authorized by the Medical Council. When the Joint Committee was organized it was stated in the bulletin that each unit member of the Committee would pay the traveling expenses of its own members. It appears that later on the Medical Council passed a resolution to the effect that it would meet only one-half the traveling expenses of those of its members who gave health lectures. This information, however, was not transmitted to the Secretary, and consequently the bulletin as published at the present time contains the original statement. It was moved and carried that the bulletin should be revised so as to conform with the rules as established by the Medical Council.

3. Report of the field work by Dr. Isaminger.

This is the close of the fifth year of the Health Education Program in the schools, the major project sponsored by the Joint Committee. Since the program was started in Detroit during the school year of 1925-26 the work has grown to the point where there is a problem of administration with the present staff.

During these five years other agencies have demonstrated more interest in health instruction and the schools themselves have progressed in the conduct of modern health education programs. The schools in general are not dependent upon the Joint Committee as they were previously. The Committee still has an important function to perform which will be more along the lines of maintaining the interest, now at a high level, promoting new programs and stimulating health education activities among schools, adult groups, such as Parent Teacher organizations, and the industrial population.

In the past the larger schools have profited most from the health lectures. The health work in these schools has also developed rapidly while the rural school has advanced slowly in this direction. Should the Joint Committee recognize this change and shift its center of attention to the smaller towns? Your field representative is of the opinion that a policy of this kind should not be stressed. The reasons are as follows:

(a) Expense is less in the cities. The cost of conducting the program in the cities in southern Michigan is very much lower when considering the returns in terms of number of lectures delivered and the number of pupils reached.

(b) More speakers in cities. Speakers are better and more accessible in the cities. Providing schools with high class speaking talent is not a problem of any magnitude in the larger communities. There are more doctors from which to select a satisfactory speaking staff.

(c) A natural trend toward smaller towns without stressing. There will be a tendency to take on

more small towns in the future because of the developments in the larger cities. We will be forced to do this if we wish to go on, without stressing it. If the program continues to grow it is obvious that efforts will bend more toward distant areas.

(d) Best reports come from the cities. The most satisfactory reports come from the Principals of the schools in the cities. The work has shown greater improvement there. For example, after five years in Detroit the school administrators have indicated their desire to continue.

Eight new counties participated in the regular program during the year, while special lectures were given in several others not on the list in previous years. During the year health lectures were given in connection with high school assemblies in 25 counties, including 106 high schools.

Some towns in the Upper Peninsula were desirous of obtaining the lecture service, beginning with the fall of 1930. Very little has been accomplished because of the distance from the University. They have depended chiefly upon Professor Henderson for educational talks. Prospects are excellent for the extension of the program to include two or three counties in this region.

The Coming Year. Instead of hurriedly covering the territory, as many as seven towns a day in some instances, in order to have the program started as soon as possible to avoid bad roads in the counties, the writer proposes to arrange a lecture in each school by correspondence for the month of October, if possible for November. This will permit ample time for the remainder of the schedule to be arranged by personal contact and the program will be under way early. This plan will result in more careful consideration to local programs and in addition, the field representative can take the time to give a lecture, preferably an illustrated one, at the school he visits. Heretofore, the first month or more of field work was given over entirely to the making of schedules.

The physician and dentists deserve to be mentioned most favorably. There has always been the highest interest and earnest cooperation among them Your field representative appreciates their sincerity and helpfulness.

In conclusion, a better type of lecture will be demanded as time goes on. We should make every effort to consider each lecture as an important assignment. The placing of the speaker before groups to which he is accustomed would be something to keep in mind by the field representative.

As a general thing, fewer talks should be given in any one school, but better ones. To this end, there should be some organization in the county. Perhaps a committee consisting of a representative of the County Medical Society, a prominent Superintendent of schools, and a public-spirited woman would tend to stimulate and maintain interest in the program. The woman might serve as a secretary, in which capacity she would arrange for lectures and make out schedules.

As soon as it can be done, a full-time director, well known among the physicians of the State, should be appointed.

4. Report of the Essay and Poster Contest. The Poster and Essay Contest conducted by the Extension Division and the Joint Committee on Public Education enlisted the cooperation of an increased number of high schools during the present year.

Of the 106 schools participating in the health program, a total of 34 took part in either the essay or poster features of the contest. One hundred forty-nine posters and 36 essays were submitted this year as against 62 posters and 25 essays last year.

The feature of the contest which seems to attract the greatest amount of attention is the annual display of posters at the time of the Schoolmasters Club. About 100 of these high school posters were put on exhibit in the office of the Recorder during the week of the Schoolmasters Club. This exhibit attracted wide attention among students of the University, visiting teachers, and members of the Faculty.

The committee which judged the posters consisted of Professor H. A. Fowler, Mr. R. T. Bittinger of the School of Architecture, and Dr. P. M. Hickey of the University Hospital. Professor Fowler, who served as chairman of the committee judging the posters, has this to say regarding the work done by high school students during the present year: "The quality of the posters seemed in general to be higher than last year. The jury, however, was confronted with the same task of selecting between clever ideas poorly presented and mediocre ideas beautifully presented."

The committee in charge of judging the essays consisted of Dr. James D. Bruce, Mr. Ralph Johnson of the English Department of the Engineering School, and Professor Kenneth T. Rowe of the Rhetoric Department. The report of this committee is not yet available, due to the fact that the grading of the essays takes considerable time.

The Poster and Essay Contest, the annual exhibit of posters at the time of the meeting of the Schoolmasters Club, and the publication of the bulletin containing the winning essays and posters has done a commendable service in advertising the health lecture program conducted by the University and the Joint Committee. The bulletin alone was responsible for numerous letters which came to the Extension office from all over the State, requesting the privilege of participating in the health program. There seems to be no doubt that the bulletin should be published again. If the winning posters could be reproduced in colors the bulletin would be much more attractive and the writer sincerely hopes that enough money will be available to make this possible. The cost of 7,500 copies of the first Health Education Program Bulletin, which included the prize-winning essays and posters was $181.51. Professor Fowler estimates that the four posters could be included in this year's bulletin in colors for $50 extra, thus making the entire cost of the bulletin approximately $235. If it is deemed inadvisable to use colors in reproducing the posters, the writer recommends the use of half tones rather than zinc etchings, in order that the drawing may stand out in clear relief.

C. A. FISHER,
Assistant Director,
Extension Division.

In connection with this report the Secretary was authorized to draw upon the Treasurer of the Joint Committee fund for $100 for the Essay and Poster prizes, covering the present year's contest. He was also authorized to draw upon the Treasurer for $200 for the publication of a bulletin descriptive of the Essay and Poster Contest.

5. Report of the Publicity Committee. Dr. Bruce, Chairman of the Publicity Committee, gave a brief outline of the publicity program carried out under his direction. He pointed out certain advantages and also certain difficulties which present themselves in connection with this activity. He stated that there are three possibilities for action

in connection with newspaper publicity. The first is to continue the present program, depending upon contributions from the various unit members. The second policy would be to publish the Joint Committee health column in conjunction with some of the larger newspaper syndicates. He advised against this, however, because of the fact that if such a policy would be adopted, the Joint Committee would lose its identity. The third possibility was to induce some Foundation interested in health education to cooperate so far as the supply of funds is concerned, with the understanding that certain specified daily newspapers of the State would be selected as a medium of publicity, the Foundation in question meeting any deficit. In conclusion, he moved that a committee of three be appointed with power to act, to confer with him in solving the publicity problem, this committee to report at the next meeting. President Ruthven appointed Drs. Jackson of Kalamazoo, Lyons of Ann Arbor, and Henderson to act on this committee, it being understood that Dr. Bruce was to be an ex-officio member of the committee.

6. Report of the Treasurer, by Dr. Warnshuis of Grand Rapids. Dr. Warnshuis' report, covering the period from November, 1919, to May 14, 1930, is as follows:

RECEIPTS

Balance from 1929	$1,486.23	
January, 1930—Detroit News	40.00	
G. R. Press	90.00	
Detroit News	40.00	
G. R. Press	112.50	
February, 1930—Mich. Hospital Assn.	100.00	
G. R. Press	90.00	
Detroit News	50.00	
March, 1930—Univ. of Michigan (1929)	500.00	
Dental Society (1929)	500.00	
Detroit News	40.00	
G. R. Press	90.00	
April, 1930—Detroit News	50.00	
G. R. Press	112.50	
		$3,301.23

DISBURSEMENTS

January, 1930—Salary checks	$ 183.33	
Neostyle	90.00	
Alumni Press	125.00	
February, 1930—Salary checks	183.33	
Don C. Lyons	58.00	
March, 1930—Salary checks	183.33	
April, 1930—Salary checks	183.33	
Alumni Press	125.00	
May, 1930—Salary checks	183.33	
Alumni Press	8.75	
		$1,323.40
Cash on hand May 14, 1930		$1,977.83

7. Report of lecture outlines for next year. After a brief discussion of the outlines submitted, by Drs. Warnshuis and Huber, it was moved by Dr. Warnshuis and seconded that the publication of the outlines, as corrected, be authorized.

8. Moved by Mr. Henderson and carried that the Joint Committee recommend to the President of the University the appointment of Dr. Bruce to take the place on the Joint Committee made vacant by the resignation of Dr. Cabot.

9. It was moved and carried that the next meeting be held in Ann Arbor next fall, subject to the call of the Secretary.

W. W. HENDERSON,
Secretary.

WHY A VACATION?

Our habits of work and recreation are to a considerable extent influenced by the seasons, and we are now entering upon the period which suggests the possibilities of relaxation from the stress of daily toil.

Books will be put aside by the children, teachers will suspend the supervision of the plastic minds, professional and business men will steal away for such time as may be possible and general efforts will be made to enjoy the freedom from daily business in preparation for another period of the routine of life.

The favorite order of the doctor is a change of scene and activity for the ambulant patient for he knows that this is usually more acceptable than prescriptions for drugs, physical therapy or investigation by the various technical procedures, but with this should go suitable advice about the unseen dangers of unfamiliar environment and caution about the amount of exercise which is prudent and will not impose undue strain on the bodily mechanism. A vacation is of value insofar as it brings power of accomplishment. It is deleterious if it in turn requires a period of recuperation from overstrenuous activities.

In giving advice with respect to vacations the doctor may here as at many other periods of his life stop and ask himself whether he should take his own prescription. If he finds an affirmative answer in his own consciousness of flagging interest in his work it may be well to have the matter decided by conference with a colleague and avoid the likelihood of having a fool for a patient. Perhaps he has found that the majority of his patients can do more and better work in eleven months than in twelve, but has never applied this knowledge to himself. If he practices that which he preaches his influence may be greater.

It is probable that the average life span is longer among the vacation groups and when it comes time again to invite the old doctors to augment some emotional appeal perhaps those who have taken care of themselves will be on the honor roll in larger numbers.

The great medical and educational activities of the first half of the year are practically over and we are pleased to wish our friends pleasant and profitable vacations.—*New England Journal of Medicine.*

GENERAL NEWS AND ANNOUNCEMENTS

Dr. G. M. Byington of Charlotte is taking a post-graduate course at Harvard Medical School.

Dr. Charles W. Heald of Battle Creek has returned from a six months' graduate study at medical centers in Europe.

The ninety-eighth annual meeting of the British Medical Association will be held in Winnipeg, Canada, August 26th to August 29th.

A splendid review of the Medical History of Michigan by Dr. J. B. Jackson of Kalamazoo appears in this number of the Journal. See page 542.

The sympathy of the medical profession is accorded Dr. J. B. and Mrs. Jackson of Kalamazoo, Michigan, in the death of their youngest daughter.

Now that the annual meeting of the American Medical Association is passed, the next place and date of importance in the annals of medicine of this state are Benton Harbor, September 15-17.

Dr. G. Van Amber Brown of Detroit was speaker at a testimonial dinner held at Cincinnati on May 21 in honor of Dr. Charles L. Bonifield. Dr. Brown's subject was, Dr. Bonifield, Surgeon and Gynecologist.

Dr. Charles Singer of London, England, who is one of the most noted medical historians in the world, delivered an address on May 21 before a scientific gathering at the University of Michigan. The address dealt with pre-Rennaisance science.

Dr. and Mrs. J. D. Bruce of Ann Arbor leave for Europe on July 1st. They will sail on the Empress of Australia which leaves Quebec on July 2d. While abroad they will spend their time principally in Edinburgh, Scotland, and in London, England.

Dr. R. L. Dixon, who has been superintendent of the Michigan Farm Colony for Epileptics at Wahjamega, Michigan, has been appointed Medical Superintendent of the Michigan Home and Training School at Lapeer to succeed the late Dr. William J. Kay.

Dr. E. G. Ahrens has resigned his position as chief of the Oakland County Tuberculosis Sanitarium and has been succeeded by Dr. A. B. Werner. Dr. Ahrens leaves in July for an extensive trip to Europe where he will visit the clinics of Vienna and Switzerland.

Dr. Walter R. Parker of Detroit, Professor of Ophthalmology in the Medical Department of the University of Michigan, will be a visiting lecturer at the first annual summer graduate course in Ophthalmology of the School of Medicine and Dentistry, University of Rochester, New York, from August 4 to 8.

Dr. Malcolm H. Soule of the Department of Bacteriology of the University of Michigan addressed the Washtenaw County Medical Society on June 9 on the subject of Some Recent Advances in Immunization. Dr. Soule has recently returned from France where he has taken special work embodied in the subject of his address.

Dr. Walter J. Wilson of Detroit spoke on the subject of Rheumatic Heart Disease before the June meeting of the Calhoun County Medical Society held at the Post Tavern, Battle Creek, on June 3. Dr. Wilson's subject was based upon a study of one hundred cases of rheumatic fever with special reference to the cardiac involvement.

The Grosse Pointe Medical Club was recently organized by the Doctors with offices in Grosse Pointe Township, which includes the four Grosse Pointe Villages and Lochmoor. Meetings are held once each month. Dr. B. H. Warren, who has been Health Commissioner of Grosse Pointe District the past twelve years, was made President.

Dr. and Mrs. William J. Stapleton and family of Detroit sailed for Hamburg, Germany, on June 26. From there they will visit Jena, Weimer, Berlin, Wurzburg, Oberammergau and the hill towns of Italy and Rome. Dr. Stapleton has shipped his automobile to Europe and will visit the places mentioned by motor. This is his eleventh European vacation trip.

The annual meeting of the American Association for the Study of Goitre will be held in Seattle, Washington, on July 10 and 11 and in Tacoma, Washington, on July 12. It is announced that the program will be supplied by thirty-four speakers, all of whom have a national reputation. The Association is represented from this district by Dr. Frederick A. Coller, Professor of Surgery of the University of Michigan.

The Detroit and Cleveland Roentgen Ray Societies met in a joint meeting at Toledo on May 22. The afternoon was spent at golf. After dinner in the evening a paper was presented by Dr. B. R. Kirkland of Rochester, Minnesota, on the subject "Roentgen Manifestations of Giant Cell Tumors." Dr. Otto Glasser of Cleveland read a biographical sketch of Roentgen and Dr. William A. Evans of Detroit presented to the Mayo Clinic a bronze bas relief of Roentgen. The gift was accepted by Dr. Kirkland on behalf of the Mayo Clinic.

Detroit can boast of being the fountain-head of one international medical society that has enjoyed a successful career. The American Radium Society was organized in this city on the occasion of the last visit of the American Medical Association, in 1916. Dr. Robert E. Loucks, President of the Society in 1922, was one of its pioneers and prime mover in the work of organization. This year the American Radium Society again met in Detroit, June 23 and 24, and Dr. Loucks, as Chairman of the Program Committee, arranged a splendid program on the uses of radium in malignant as well as some non-malignant conditions.—*Wayne County Medical Bulletin.*

The American College of Physicians announces the John Phillips' memorial prize of $1,500 to be awarded for the most meritorious contribution in internal medicine and sciences contributing thereto. All papers must be mailed to the executive secretary, Dr. E. R. Loveland, Philadelphia, Pa., by August 31, 1930. Among the conditions are: the contribution must be in the form of a thesis based upon published or unpublished original work. It must be in English of which three copies must be submitted. The dissertation must be based upon work done either whole or in part in the United States or Canada. The successful paper will be read at the next annual meeting of the College of Physicians.

Dr. C. C. Slemons, who was appointed as temporary Commissioner of Health for the State of Michigan following the death of Dr. Guy L. Kiefer, has been made permanent Commissioner of Health. Dr. Slemons was educated at the Ferris Institute, Big Rapids, Michigan, and at the University of Illinois. He obtained his M.D. degree from the Detroit College of Medicine in 1905. He began practice in North Branch, Michigan, in 1905 but moved the following year to Grand Rapids, where he has practised to the present time. Dr. Slemons was city bacteriologist from 1907 to 1908 and was appointed Health Officer of Grand Rapids in 1908 on part-time service. He had been full-time Health Officer in 1918. He has also been a member of the State Council of Health since 1918.

Following the post-graduate courses given in Detroit, physicians will be able to continue with emphasis on the more academic phases of medicine at the summer school at Ann Arbor which begins on June 30 and continues to August 8. Courses cover work in anatomy, bacteriology, dermatology and syphilology, internal medicine, neurology, obstetrics and gynecology, ophthalmology, otolaryngology, pathology, pediatrics, pharmacology, materia medica and therapeutics, physiologic chemistry, physiology, roentgenology and surgery. Some of the laboratory work will extend to August 22. There is also announced special week-end public health institutes of interest to practitioners of medicine who for some reason or other cannot avail themselves of the regular term work. Information in regard to this phase of the work may be obtained from Dr. John Sundwall, Director of the Division of Hygiene and Public Health at the University.

The annual Inter-City medical meeting sponsored by the Bay County Medical Society, was held at Fisher's Hotel, Frankenmuth, Friday evening, May 9 at 7:00 o'clock.

Over three hundred physicians and surgeons of the state attended the meeting, coming from as far north as the Soo and as far south as Detroit. The splendid turnout was very gratifying to the committee who were untiring in their efforts to make the meeting a success.

Herman Fisher served one of his old fashioned chicken dinners and his dining room facilities were taxed to the limit to care for the crowd.

The meeting was opened by President Charles W. Ash of the Bay County Society. He introduced Dr. J. D. Brook, president of the Michigan State Medical Society, who presided at the meeting. Dr. Brook announced the death of Dr. Guy Kiefer, State Commissioner of Health. The whole assembly stood at silent attention out of respect to the departed.

The speaker of the evening, Dr. George W. Crile, Cleveland, Ohio, gave a most enlightening talk on the subject, "Thyroidectomy—Its Indications—Its Methods—Its Complications—Its End-results," illustrated with chalk diagrams. The transcript of the talk will appear at a later date, probably in the State Journal.

THE FIFTH ANNUAL MEETING MICHIGAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS

The May issue of the Journal made brief note of the annual meeting of the Michigan Association of Industrial Physicians and Surgeons that was held in Flint in the Hurley Hospital, Friday, April 25, merely giving the subjects and order of the program as it was presented.

As a result of the sentiment expressed at the meeting of the Association at Jackson last September, the Board of Directors arranged to hold the annual meeting in April, with a program of clinics, business sessions, professional papers and discussions, and an evening dinner and address. The directors and committees are highly gratified with the results of the efforts to renew interest and activity in the society.

There were 138 registered at the meeting and over 150 attended the various sessions. The local arrangements were ideal, thanks to Dr. Carl Moll and his committee, and Dr. Clifford Brainard's committee provided a program that fully justified the great interest and enthusiasm shown. Stenographic minutes of the business sessions are contained in the secretary's records, of which a brief résumé is here given.

The business sessions were devoted principally to the reports of committees. Certain features of these reports were of special interest and significance. The membership committee, Dr. T. H. Heavenrich, Chairman, presented the names of 70 new applicants who were elected to active membership in the association.

The committee on Constitution and By-laws, Dr. J. G. R. Manwaring, Chairman, presented four amendments to the by-laws. A spirited discussion on the adoption of these amendments was engaged in by Doctors Christensen, Hafford, Stone, Poole, Knapp, Moll, Penberthy, Wood, Heavenrich, Pyle, Lecklider, Kiefer and Gorsline. As amended, the by-laws require: that, to be eligible to membership in the Michigan Association of Industrial Physicians and Surgeons one must be a member of the county medical society; that applications for membership must be endorsed by the secretary of the county medical society and one member of this association, and presented to the secretary of the association with the annual dues of $3.00; that the fiscal year shall date from May first; that the annual meeting shall be held in the month of April, the exact date and place of meeting to be decided by the board of directors.

For the next annual meeting, invitations were presented from the Mayor, the Board of Commerce, and the Convention Bureau of Detroit. Dr. Penberthy stated that the members from Detroit would like very much to have the next meeting, but, if any other cities cared to extend an invitation the Detroit delegation would stand by and give them support. Members from other cities were instructed to present to the board of directors their bids for the next meeting, if they wished to entertain it.

All the association executive officers were re-elected, as also was Dr. Moll to succeed himself on the board. Following is the personnel of the board of directors: President, Dr. C. S. Gorsline; Vice President, Dr. C. W. Brainard; Secretary-Treasurer, Dr. F. A. Poole; Directors: for one year, Dr. R. H. Denham; for two years, Dr. G. C. Penberthy; for three years, Dr. Carl F. Moll.

Many suggestions were made, most of them touching upon the economic phases of industrial practice, and the board of directors have in mind the appointment of strong committees to investigate the many problems and bring in reports and recommendations at the next annual meeting. It was the prevailing opinion, as expressed, that one day for the annual meeting is too limited a time to cover a year's work and give adequate attention to both business and scientific problems. This matter will be given careful consideration in planning the next program.

C. S. GORSLINE,
President.

COMMUNICATIONS

SPHENOPALATINE PHENOMENA

Reply to Doctor McClintic

To the Editor:

In reply to the communication of Dr. C. F. McClintic in the June issue of the JOURNAL, it is regrettable if the doctor has inferred any unfriendliness in my expression which he quotes from the April issue: "Familiarity with the phenomena associated with the sphenopalatine test and due regard for their import would have saved McClintic from the error that 'eye pain is transmitted via the sphenopalatine ganglion.'" The necessity for exposing the fallacy to which the doctor committed himself was keenly regretted. A scientific treatment of the subject, however, demanded that this fallacy be exposed. It was endeavored to couch the correction in the simple and candid language of science, and it was even hoped that the doctor would welcome it in the spirit of a seeker after truth.

No embarrassment should attend the correction of an error disclosed in a field with which he could not be expected to be familiar; for it should be understood that familiarity with sphenopalatine phenomena cannot be acquired in a day; not only is it necessary to wait for instructive cases, but when such a case is found it may be necessary to subject it to repeated tests under varying conditions and in various combinations of nerve injection before the new information that it can yield to research of this kind has been exhausted. Moreover, familiarity with sphenopalatine phenomena as they are observable about the eye requires access to eye cases over a long period of time, such as is hardly possible except in an ophthalmological practice. I mention this to exonerate the doctor from discredit in not being familiar with these phenomena, with which one practicing a surgical specialty such as his can have only the most limited contact.

The limitations imposed by his specialty upon his facilities for observation are shown in his expression: "I never consider operation for trifacial neuralgia or other head pains until I am satisfied that head pains cannot be relieved by anesthetization of this ganglion" (the sphenopalatine). Familiarity with sphenopalatine phenomena would have made him know that the distribution of the trifacial nerve is the one great region of the body in which it is well nigh hopeless to attempt sphenopalatine treatment, the exceptions being in the peripheral zone in which the distribution of the trifacial nerve and that of the sphenopalatine ganglion overlap, and these, after all, are not really exceptions, but special cases with which trifacial neuralgia may be confused.

It would be illuminating to Dr. McClintic, to whose mind these phenomena have as yet presented no perplexing problems, if, in a case of pain in the cornea or conjunctiva, as keratitis or conjunctivitis, he would anesthetize the sphenopalatine ganglion of the same side, and after having satisfied himself that the pain has been relieved, then, taking a wisp of cotton, would test the eye for sensitiveness, to determine whether the relief was really obtained by blocking the path of pain.

The results of this test should indicate to him that the clinician is not without a function to perform in neuro-anatomical discussion; for although the clinician may not be qualified to give an interpretation for the facts he discloses, it is within his province to say that no interpretation shall stand that is in conflict with them. In science the observed fact is the supreme authority.

It is a happy coincidence that Dr. McClintic mentions with approval that outstanding neuro-anatomist, Dr. Stephen W. Ranson. On this very question of eye pain I recently wrote to Dr. Ranson. In his reply he said: "I wish I could answer your questions. Dr. Sluder and I often went over this ground together and discussed the various possible explanations of the relief of pain obtained by anesthetization of the sphenopalatine ganglion. The conclusion which I reached was that it cannot be reconciled with present day conceptions of the anatomy and physiology of the nervous system. Since so many clinicians have confirmed Sluder's findings, I am keeping an open mind but I cannot see the solution."

Perhaps the most surprising of Dr. McClintic's expressions is his dictum in a field with which his acquaintance is necessarily superficial: "Every clinical observation that Dr. Byrd has made can be explained upon a scientific basis without postulating or theorizing . . . and the results that he claims are not new. . . ." This impetuous dictum is in striking contrast with the calm open-mindedness with which a neuro-anatomist of Dr. Ranson's standing views the disclosure of facts at variance with present day conceptions of physiology.

Moreover, the scientific candor with which Dr. Ranson concedes that he sees no explanation for these phenomena should make one hesitate before averring that they are all explained and contain nothing new. Dr. Ranson's example should make it easy to admit, with Will Rogers, that we are all ignorant, but about different things.

HIRAM BYRD.

2201 E. Jefferson Avenue,
Detroit.
June 7, 1930.

A LOCATION FOR A YOUNG DOCTOR

Journal of the Michigan State Medical Society.

To the Editor:

The first of last April my husband, Dr. Long, died. I have his office equipment to dispose of and am very anxious to do this as soon as possible. Do you not know of some young doctor who is looking for a good opening? There is a splendid opening here just now. Our little city has four practicing physicians. Should you know of some one and will give me his name and address, I would be very glad to write him in regard to equipment, practice, and fees as they are here.

MRS. NELLIE LONG,
Eaton Rapids,
Michigan.

VIGANTOL NOT ACCEPTED

"Viosterol" is the name adopted by the Council on Pharmacy and Chemistry for irradiated ergosterol, and "viosterol in oil 100 D" for a solution in vegetable oil having one hundred times the antirachitic potency of a standard cod liver oil. All of the firms licensed by the University of Wisconsin Foundation to prepare this preparation have agreed to coöperate with the Council on Pharmacy and Chemistry, by using this name, except the Winthrop Chemical Company. The Winthrop Chemical Company has determined to call its product "Vigantol," notwithstanding the fact that the Council has declared that the application of such a proprietary name is contrary to the best interests of the medical profession and the public. The medical profession must support the Council in this type of work if the Council's efforts are to be effective. (Jour. A. M. A., February 8, 1930, p. 415.)

WOMAN'S AUXILIARY, MICHIGAN STATE MEDICAL SOCIETY
MRS L. J. HARRIS, President, Jackson, Mich.
MRS. J. EARL McINTYRE, Secretary, Lansing, Mich.

WOMAN'S AUXILIARY TO THE BAY COUNTY MEDICAL SOCIETY

The Auxiliary met May 9 for a pot-luck supper at the home of Mrs. E. A. Wittwer on N. Henry Street. Twenty members were present.

Mrs. P. R. Urmston, president, conducted the business meeting.

The election of delegates to the A. M. A. at Detroit in June resulted as:

1. Mrs. P. R. Urmston
2. Mrs. A. W. Herrick

Alternates:

1. Mrs. A. D. Allen
2. Mrs. M. R. Slattery

The delegate to the State Auxiliary Medical Meeting was also elected, Mrs. V. H. Dumond.

The subscription for the Hygeia magazines which were placed last year were ordered renewed.

The meeting adjourned for a social hour.

Mrs. M. R. Slattery showed movies, which were greatly enjoyed. We thank her very much and Mrs. Wittwer for her hospitality.

MRS. P. R. URMSTON.

WOMAN'S AUXILIARY TO THE INGHAM COUNTY MEDICAL SOCIETY

Mrs. Charles P. Doyle was chosen president of the auxiliary to the Ingham County Medical Society for the ensuing year at the luncheon and annual meeting of the organization held Monday afternoon in the Wisteria Room of the Hotel Olds, Lansing.

Other new officers are: Mrs. P. C. Strauss, vice-president, and Mrs. A. M. Campbell, secretary and treasurer. They will succeed the retiring officers, Mrs. L. C. Hart, President, Mrs. L. C. Towne, vice-president, and Mrs. William McNamara, secretary and treasurer.

Covers were laid for 40 at the luncheon tables, which were embellished with bowls of many hued spring flowers. Mrs. B. Harris, State President, of Jackson, was present at the meeting and gave a short talk. Mrs. George P. Todd of Detroit was an out-of-town guest. Following the luncheon and meeting bridge was played, with honors going to Mrs. P. C. Strauss and Mrs. Harry Wilson.

Mrs. Wilson was in charge of arrangements, assisted by Mrs. M. C. Loree. The entertainment committee was composed of Mrs. L. H. Darling, Mrs. Howard Wilson, and Mrs. Milton Shaw.

VITAMIN D IN TUBERCULOSIS

A recent investigation of the role of vitamin D in the management of tuberculosis indicated that the administration of viosterol did not produce any detectable acceleration of the healing process. These observations suggest that such value as cod liver oil possesses in tuberculosis does not depend on its relatively high concentration of vitamin D. These studies emphasize the fact that cod liver oil possesses more than one claim to nutritive value, for it is even richer in vitamin A than in the antirachitic factor. In spite of the enormous antirachitic potency of viosterol, this material is by no means to be regarded as therapeutically equivalent to cod liver oil. (Jour. A. M. A., February 8, 1930, p. 414.)

COUNTY SOCIETIES

OAKLAND COUNTY

Dr. J. G. R. Manwaring, Flint physician, and Dr. C. J. Lyons, University of Michigan dental instructor, talked on "Focal Infections" at a joint meeting of the Oakland County Medical Society and the Oakland County Dental society at the Board of Commerce, Thursday evening, May 15, 1930.

A focal infection was defined as one in which the bacteria exist in a relatively small area of the body and from there are sent out into the blood, often producing disease and functional disorders in other parts which may be remote from the primary focus.

Dr. Manwaring discussed the subject with respect to infections about the body and Dr. Lyons stressed the point of infections about the teeth and mouth after describing the development of the dental profession over the past 100 years.

Dr. LeRoy F. Hill, president of the dentists, introduced Dr. Lyons and Dr. L. C. Sheffield, program chairman, introduced Dr. Manwaring. Dr. B. M. Mitchell is president of the county physicians' group. Both the dental and medical societies held brief business sessions prior to the joint program, the latter body electing Dr. E. L. Spoehr of Ferndale to membership.

The next meeting of the physicians will be at Royal Oak, June 19.

The Oakland County Medical Society held its annual golf tournament Wednesday at the Glen Oaks Golf club. Forty attended the dinner, which followed the afternoon of golf.

The Chapman trophy, a large silver cup donated by Dr. H. S. Chapman, was won by Dr. O. O. Beck of Birmingham, with a score of 91. Dr. A. L. Brannock was winner of the cup last year. Runners-up this year were Dr. E. V. Howlett, 94, and Dr. B. T. Larson, 96.

The Dr. Dubbs trophy was awarded to Dr. F. S. Bachelder.

Winners in the kickers handicap were Dr. F. A. Mercer, Dr. F. B. Gerls, Dr. L. W. Gatley and Dr. J. J. Murphy.

Dr. Chapman presented the trophy at the dinner.

BERRIEN COUNTY

One of the most enthusiastic and worth while meetings held in some time was the May meeting of the Berrien-Cass Medical Societies. The two societies held a quarterly meeting in Cass County, with the members of the Cass County Society acting as hosts.

Dinner was served at 6:30 to 45 guests at the Shore Acres Hotel at Diamond Lake located just a short distance from Cassopolis. Following this a short business meeting was held and then the members listened to an extremely interesting and practical talk by Dr. Alexander M. Campbell of Grand Rapids on "A Practical Consideration of Uterine Hemorrhage."

To all who have heard Dr. Campbell talk it is needless to say that for interesting and practical considerations of the subjects facing the general practitioner he is an artist. His subject, manner of

presentation and personality keeps his audience under constant attention as shown by the interesting and worth while discusson which followed his talk.

Dealing with the importance and relative frequency of severe hemorrhage, the etiology, pathology and treatment were discussed in an orderly and practical manner. Accompanied by slides and specimens to illustrate, as well as instruments to demonstrate the procedures, his talk was made more than usually interesting. Particularly the value and safety of early packing of the post-partum uterus in case of hemorrhage was clearly demonstrated. The necessity of careful examinations, and sound exploration of the uterus of senile type was spoken of to diagnose early malignancy. The complete review, summary and new methods of treatment made the paper one of the best that we have ever heard.

W. C. ELLET, *Secretary.*

IONIA-MONTCALM COUNTY

The May meeting of the Ionia-Montcalm Medical Society began with a splendid dinner ably served by Doctor Robertson's staff in the officers' dining room at the State Hospital, and ably disposed of by the twenty-seven attending members.

After the dinner the meeting was transferred to the Hospital Chapel, where a short business session preceded the scientific program.

Secretary read letter from the State Secretary calling a meeting of Chairmen of all County medico-legal committees at Ann Arbor, May 16. President Robertson appointed Doctors Johnson, Pinkham and McCann to constitute such a committee.

Secretary instructed to convey to the family of the late Doctor Kiefer, State Commissioner of Health, the condolence of the Society and its sense of loss in his death.

Secretary instructed to correspond with State Secretary regarding the possibility of receiving dentists as associate members of the county society.

The first paper of the program, that of Doctor Duvals, on "Early Symptoms of Mental Diseases and their Recognition by Physicians in General Practice," was read by Doctor Imus in the absence of Doctor Duval. It was very comprehensive, well prepared and well received by the audience. The Secretary was instructed to send a message to Doctor Duval, expressing the appreciation of the Society and its good wishes for his return.

Doctor Imus gave a summary of the experience of himself and others in treatment of syphilis of the central nervous system; his successes, fair results, and failures. This paper was illustrated by the presentation of patients so treated. Doctors were intensely interested, almost startled, by the results obtained in many serious paretic cases.

Doctor Robertson gave a very able and scholarly paper on the relative bearing on crime shown by the various groups of insane, in this and five of the other seven hospitals for the criminal insane throughout the country.

This paper was the report of a very intensive study of insanity and crime, with a correlation of diagnosis, and incidence as a cause of crime, in a total of 3,800 cases.

A request, that he allow us to offer his paper for publication in the state journal was granted with his accustomed modesty.

The meeting adjourned after voting its appreciation to Doctor Robertson and his co-laborers for providing a very successful meeting.

Following the adjournment, the Medico-legal Committee met and elected Dr. John J. McCann to attend the Ann Arbor meeting, on May 16.

JOHN J. MCCANN, *Secretary.*

THE EDITOR'S EASY CHAIR

THE BIOLOGIST AND THE PROBLEMS OF LIFE*

Those things which stimulate scientific men to study the world about them do not seem to be well understood even by the majority of educated people. In an age such as this when literally thousands of men and women are engaged in scientific investigation and when people generally appear to respect the investigator, such lack of understanding may appear rather strange. When, however, one considers that the scientist appeals in his writing to a group of professional readers and that scientific progress is heralded to the public, more often than not, by the appearance of impersonal mechanical inventions or fantastic press notices, a correct evaluation of the scientist is not to be expected. Since science has a dominating influence over our lives it is desirable to understand the scientific worker.

Like the artist or philosopher, the scientist is an individualist. He must renounce authority and form personal judgments about the facts of his study. It is this personal association with his subject, the playing with ideas, the silent argument of apparently conflicting data, the weaving of hypotheses to cover the ever-growing body of facts which is the dominant interest of the investigator. In the same way that a physician is interested in the recognition of a disease syndrome and interpreting its meaning and consequences, the investigator is devoted to the relation of fact to generalization. How little of this aspect of science is understood by the average person!

THE SCIENTIST AND THE PUBLIC

Pure science is not self-sustaining and from its very nature cannot be. In the past, scientific studies have been largely fostered by the patronage of an aristocratic class, now they are supported more or less directly by the public. As Charles II financed the experiments of the physiologist Harvey, so the public of today finances the work of a large number of investigators. Charles, however, was able from time to time to stand by Harvey's side, to observe the facts which Harvey observed, to be stimulated by his enthusiasm and, perhaps, to share it. Those who supply the funds for modern research may not be so privileged but many scientific men are awakening to the need of encouraging public interest. Many are providing general non-technical articles and books for the dissemination of their facts, their theories and their interests. One need but mention the success of Eddington, Jeans, Haldane, J. A. Thompson, Julian Huxley, Herrick and Tilney in presenting scientific concepts in a way to render them intelligible at least to the generally educated reader.

In the field of general biology the writings of scientific men are not only of interest but tend to make possible a more satisfactory way of living. The interest of such a subject and the cautious but stimulating enthusiasm of the scientist seldom have been brought together more successfully than in a recent work† by a number of scientific men. In this work we may read beyond the exposition of scientific data and see something of the personal thought-characteristics of the scientist. This is possible not only because the articles are written primarily for general reading but because of the very fact that a

*Written for this department at the request of the editor.

†See footnote on page 540.

number of men have contributed. The reader correlates the work of the different writers and is able to see thereby certain general characteristics which pervade all the articles. These characteristics (scientific imagination and the love of specific observation, analysis, correlation, and evaluation), which are in a way the distinguishing mark of the scientist, must be treated sympathetically, since they have had, indirectly perhaps, such great influence upon civilization.

LIFE IN SPACE

Perplexing questions arise in every field of human thought, and the biologist may be confronted with such as: "How widespread a phenomenon is life?" "When did life originate and how?" "How long has life lasted and how long will it continue?" The earth-bound biologist has searched mountains and the ocean depths, hot springs, deserts and the polar regions and has found evidence of living things everywhere on the earth's surface. The imagination suggests the possibility of life occurring elsewhere than on our earth. Although astronomical instruments may give much accurate data, our telescopes are too imperfect to observe the heavenly bodies directly for evidence of life. But may not the astronomer have indirect evidence? Professor Henry N. Russell, of Princeton, has examined astronomical knowledge to find whether any of the heavenly bodies may support life, that is, organisms whose chemistry and metabolism are of the same nature as those with which we are familiar. Certain conditions are essential for the support of life, namely, "an adequate temperature, sunlight, water, atmospheric oxygen, a land surface, days, seasons, an adequate force of gravity, and a sufficient atmospheric density."

Of the billion heavenly bodies known to astronomy most may be disregarded; the stars are too hot for living organisms and the nebulæ and comets are gaseous. The hundreds of asteroids and the satellites of the larger planets are too small to hold an atmosphere. Of the nine planets of the solar system, the only other known bodies, Mars alone possesses an atmosphere, has a suitable temperature, oxygen, water and a daily rotation similar to that of the earth. Mars may support life, but does it? We do not know; there is some evidence, however, in favor of it. Photographs of the planet show green or gray markings which are "prominent in the spring of the hemisphere in which they lie, and tend to fade out in the autumn and winter [this fading is correlated with the spread of the polar ice caps], at which season the color sometimes changes from greenish to yellow or brown. These changes, though repeating themselves in successive seasons, show considerable irregularity." The "canals" too show seasonal changes in visibility which run parallel to those of the dark areas. May not these changing patches indicate seasonal changes of vegetation, and the canals, waterways banked by plant life? An observer on Mars with the equipment of the modern astronomer might see similar changes on the earth's surface. The high oxygen content of the atmosphere of Mars might seem to be associated with the photosynthetic action of plants rather than with any inorganic process. With plants present, animal life could be maintained.

If such indications be given credence, life may not be a peculiarity of our planet but may be a phenomenon which arises fortuitously wherever and whenever conditions are favorable. If life should be found to exist on any other planet, it would be another shock, as the researches of Copernicus and Darwin were, to man's egocentricity; a blow of the type which has always had a wholesome effect on man, and which reveals the magnificent uniformity pervading nature.

LIFE IN TIME

The radioactive element uranium is slowly transformed (one per cent in sixty-six million years) to lead (which differs from ordinary lead by a slight difference of atomic weight). Uranium was laid in deposits at the time when the earth cooled and the earth crust was formed. When the relative amounts of uranium and lead from these deposits is determined the length of time since uranium was first laid down may be estimated; this is the time of formation of the earth's crust and it appears to have been less than five billion years. Life evidently arose since that time.

The source of earthly energy is the Sun, a body which is gradually becoming smaller through the loss of radiant energy. "To a single pound of mass corresponds heat enough to raise 20,000,000 tons of rock to a temperature of 2000° C . . . the sun's total radiation corresponds to a loss of 4,600,000 tons a second." Even so "the sun would last for 15,000,000,000,000 years." The sun may thus supply light and heat to maintain life on earth for tens or hundreds of billions of years as it has done for the past billion or more years.

THE ORIGIN OF LIFE

As to the origin of life there is further mystery. The synthesis of organic compounds in the laboratory and the fact that spectroscopic examinations of stars have shown hydrocarbons to be present and to be more complex on cooler stars than on the larger hotter bodies, suggest that organic compounds might appear spontaneously. With the cooling of a stellar sphere condensation of water occurs and with it ionization phenomena. Catalysts are formed, and the organic compounds increase in complexity; perhaps amino acids, peptides, and simple proteins are synthesized. "The primal organism," says Macallum, "was ultra-microscopic in size, was of comparatively simple constitution, and began as the product of the union in a special complex of a number of amino acids which were formed from constituents of the atmosphere when the condensations of water vapor, at or below 100° C., were continuous, and when also evaporation of small isolated bodies of water concentrated the amino acids in them and rendered the synthesis of them into complexes, millions in number, one of which had 'the promise and potency of all terrestrial life.'" Only in this way may we account for the origin of life.

LIFE, INTEGRATED AND CORRELATED

The early, possibly ultra-microscopic life germ differentiated, gained characters, lost others and eventually became a cell. The possibility of reproduction developed. Macallum believes that the cell nucleus may have developed by concentration of the reproductive elements as a reaction to the increased saltiness of the sea-water environment over eons of time. Mitosis occurred at least before the separation of animal and plant forms. Then followed the progressive differentiation of animals and plants, the

---

†Human Biology and Racial Welfare, edited by Edmund V. Cowdry with the coöperation of Walter B. Cannon, Alexis Carrel, Edmund V. Cowdry, Edwin Grant Conklin, Charles B. Davenport, John Dewey, Haven Emerson, John F. Fulton, William King Gregory, William Healy, Ales Hrdlicka, Ellsworth Huntington, Paul A. Lewis, Archibald B. Macallum, Elmer V. McCollum, Robert A. Millikan, George H. Parker, Harry A. Overstreet, Raymond Pearl, Earle B. Phelps, Sir Humphry Rolleston, Henry Norris Russell, Sir Chas. S. Sherrington, William M. Wheeler, Clark Wissler, Robert M. Yerkes, Hans Zinsser, with an introduction by Edwin R. Embree. 612 pp. Paul B. Hoeber, Inc., New York. 1930. $6.00.

adaptation to new environments and the formation of new life patterns. In short, the whole series of changes which we know as evolution began. One organ or another, quick muscles, a strong armor, or an efficient brain became the dominant feature—the feature of survival value. All these changes with which we are familiar through the studies of biologists of the last seventy years resulted in countless animals and plants, as well as in man.

Although there have been innumerable changes in body form or function, the individual cell has always had certain problems to meet and has met them in similar ways, changing its characteristics or habits only when the organism as a whole seemed to profit.

The cells of more complex animals have under favorable circumstances the property of forming or controlling their own environment. Back in early geological times when multicellular animals first appeared, a certain amount of their sea-water environment was walled off to form an intercellular fluid matrix. The sea water had salts in concentration different from what it contains at present, and in it cells acted efficiently. Although the organism as a whole may have had a variable environment, this intercellular fluid became the real environment of the cells. When animals began to take to land they brought with them the old internal environment which had served them so efficiently. Sea water has since changed its concentration of salts (particularly the proportion of sodium and potassium) by the solution of land substances but the animal has retained its old internal environment which, as Macallum has shown, is similar in vastly different animals. The problems of metabolism which have been solved, or are being studied by physiologists, are directed to the relationship between the cells and the internal environment. The problem of cells as functional units is the protection and maintenance of an environment in which the body-cells-as-organism can maintain itself.

Although the organism has problems within its own body which it must solve in order to exist, it also has problems associated with its more variable outer environment. Of these, the practical problems of existence, the biologist has also something to say.

THE BIOLOGIST AND HUMAN PROBLEMS

Human biology may be considered in two categories, first that which concerns the harmonious relation of man to his external environment and second the problem of man and the future. In a wide sense the first of these is the problem of health. It is the healthy man or community which is best adapted to meet the vicissitudes of life. When a man is living efficiently and orderly he is getting real satisfaction out of life. The immediate and practical problem of human biology is to discover those conditions which are desirable and to find means for making them available to a greater number of people.

Since early times the human race has spread to nearly every part of the world; it has had to meet different environmental circumstances. Some of these have been for the betterment of the race and some otherwise. The biologist has been studying man under these assumed conditions to find the essential or optimum factors of environment. He is checking his findings by laboratory studies so that undesirable conditions may be eliminated and desirable factors encouraged.

Shelter and food are man's immediate needs. The world provides very different climatic conditions, and though man has been able to survive them, he has flourished under some conditions and in others he has merely existed. Statistical studies have revealed correlation between the energy or adaptability of man and these various conditions. Studies on mental and physical efficiency under various enforced laboratory conditions have provided data which indicate the best physical environment for him. Biochemists and dieticians have analyzed foods and have discovered their useful elements, the essential amino acids and the food principles.

Man as a social animal has congregated in cities, has adopted an unsettled and hurried life, sunless avenues of masonry and mechanical devices which have impinged upon his natural physical vigor. He has rendered himself more susceptible to infectious diseases and has collected about him anti-social or atavistic individuals who have made his life dangerous or expensive.

Sociologists are studying these conditions. New ways of treatment of the criminal have developed; health officers and physicians are working to reduce disease to a minimum; educational facilities are being developed for the adaptation of children and adults as well to a changing environment. Medical science has eliminated certain diseases, has developed cures for others, is learning the nature of still more and has developed ways of immunizing people against infections. Man is providing countless ways of protecting himself against the unfavorable circumstances of his environment. But is he concerned with the conditions of tomorrow as well as those of today?

THE FUTURE OF MAN

The question arises, "How long can we continue to live as we do now?" A stable food supply and a rapidly increasing population demand the answer, "not long." Life has become increasingly complex. Men are finding the pace too fast and are becoming broken in health or are dying at an early age. The world's greatest need now is, and in the future will be, better men.

Biologists during the past thirty years have discovered some of the principles of heredity, the laws of inheritance have been studied in man as well as in the lower animals and the effect of genetic factors upon development is being learned. It has been found that by judicious breeding certain desirable characters may be brought out in a race and others repressed. The logical inference is that of his own free will man should be able to better the condition of his progeny. This means that through selective breeding and through a thorough understanding of sex and marriage a high class of offspring may be produced and nourished under optimum environmental conditions. Likewise the biologically unfit will be discouraged from procreation. The separation of man into races is an evolutionary process and it is along the lines indicated by race differences that evolutionary progress of man will result. Although the most rigid eugenic measures may or may not encourage advance, they will allow man to realize his full possibilities as a human being.

The matter of eugenics has been found to work very successfully in the production of a superior quality of animals where it has been possible to carry out artificial selection to the fullest extent. When it comes to be applied to human beings we are confronted at once with the problem of free will, the rights and privileges of man. Artificial selection is possible only to a limited extent at present when applied to human beings and that largely for the purpose of elimination of what might turn out to be mentally deficient. In other words we have segregation of the feeble-minded and such sterilization as is legally permissible to prevent the procreation of this class. There is no question as to the desirability of healthy children and as many of them as may be given suitable opportunity to grow to be useful and intelligent citizens.

—W. T. DEMPSTER

THE DOCTOR'S LIBRARY

THE MEDICAL HISTORY OF MICHIGAN

Reviewed by J. B. JACKSON, M.D.
KALAMAZOO, MICHIGAN

The first volume of our Medical History of Michigan is now in print and is a source of satisfaction and pride to all who have had any part in its preparation. Members of the Michigan State Medical Society may feel that this volume is a fitting memorial to the medical pioneers of Michigan who have literally "blazed the trail" for modern medical practice. This work is an answer to Dr. Comstock's question of nearly fifty years ago, "What has the State Medical Society done toward perpetuating the life and services of her deceased and honored members?"

On reading this book one is immediately impressed with the great amount of material and the many sources of information involved in its preparation. The history of the medical profession in Michigan is inseparable from that of the general history of the state. The preparation of this volume necessitated an intimate knowledge of the development of our state from its very earliest days. In addition to this, the great mass of biographical data has necessitated the reviewing of material from many different sources.

The first chapter deals with "The Doctor Mainly from the Layman's Viewpoint." The author begins the book with a sentence which with its quaint humor is an index to the pages that follow. "It is helpful and disciplinary though not invariably contributory to self esteem for the physician to contemplate his significance from other than the professional angle." There follow laymen's estimates of the profession, some amusing, some "disciplinary," and some cheering. The author's final conclusion is that "By and large in the composite estimate, so to speak, the guild has not fared badly," but he adds "Blessed are the Meek."

The chapter on "The American Indian" contains much of interest and of historical value. It includes references to widely distributed tribes, for "Indians were in earlier times even more nomadic than automobile tourists of today." The Indian's mentality, manners, morals and medicine are discussed. Not the least interesting of the many interesting matters written of in this chapter is a portion devoted to "The Emotional Sphere." "The women, like the men, paint their faces with red ochre, they omit nothing to make themselves lovely. The antecedents of the flapper and their just precedence chronologically should not be ignored by the twentieth century copy cat."

There follows a chapter on "Physicians with the Early Explorers and Adventurers" and one on "Eighteenth Century Michigan Physicians." These chapters are an adequate history of the earliest medical practice in the state and give one an appreciation of the great difficulties under which the medical man carried on his labors in those days. "It is altogether probable that one Jean Michel was of the pale-face race, the medical man having had the enviable opportunity to see Michigan first." Henry Belisle "seems to have been Detroit's first physician and surgeon."

Chapter V contains much of pioneer history and discusses the large part that the medical profession had in its making. "A Pioneer History of the Township of Grand Blanc" by Alvah Brainerd is especially of interest.

The work of William Beaumont is dealt with in the following chapter. It is especially fitting that "Michigan's Significant Contribution to the World's Medical History" should have a prominent place in such a book. Illustrations of the house in which Alexis St. Martin was wounded and of the Beaumont Monument on Mackinac Island add much to this very sincere appreciation of Beaumont's work so well expressed by the authors.

There follow two chapters which probably appeal most to medical men of today. These chapters contain biographical sketches and anecdotes of the medical men of the last century. One can be sure that this is quite what Dr. Comstock had in mind when in 1881 he wrote, "A thoroughly educated and virtuous doctor is the highest type of man. . . . He has an undoubted right to live in history for his own sake and the sake of the good cause with which his life has been crowned." Here is found such a wealth of biographical details that one marvels at the time and labor which must have been necessary to collect them. Practically every part of the state is represented in these sketches.

The chapter on Medical Education in Michigan written by Dr. Dempster is of

especial interest to those who have had their medical education in Michigan schools. It is a particularly happy handling of a subject which has been the source of some controversy in the past. This chapter is a distinct contribution to medical history.

The chapter on "A Master Surgeon," an appreciation of Dr. Theodore A. McGraw by Dr. Frederick A. Coller, is deserving of special mention. "So long as our profession can produce master surgeons such as Theodore A. McGraw as examples for newer generations of surgeons, our only errors will be when we deviate from the path they have blazed."

"Some Medical Men and Methods of Yester-year—Contacts and Close-ups" is a chapter devoted to biographical sketches of some of the professional leaders with whom the author was very closely associated; Hurd. Christian, Longyear, Manton, Warren. Inglis, Vaughan. These are all men whose memory we honor and of whose service to mankind we are justly proud. These "close-ups" are fascinating history and are of inestimable value.

Chapter XII deals with the History of Medical Journalism in Michigan and is written by Dr. Walter H. Sawyer. The earliest publication on Medicine in Michigan was the "Michigan Journal of Homeopathy" published at Detroit November 11, 1848. The regular profession felt the need of a medium of expression and in 1853 espoused the cause and interests of a medical publication which came into being under the name of "The Peninsular Journal of Medicine and The Collateral Sciences." The Journal of the Michigan State Medical Society was first issued in September, 1902. It has had five editors, A. P. Biddle, B. R. Schenk, Wilfred Haughey, F. C. Warnshuis, and J. H. Dempster.

The chapters on "Diagnostic Aids and Therapy" and on "Prevailing Diseases and Epidemics" contain many things that impress present day physicians with the changing status of medical practice.

The last chapter, on Public Health Work in Michigan, was written by Dr. Guy L. Kiefer, whose recent death is so great a loss to our professional ranks. This section contains many interesting facts and statistics which are thus available to history in a brief but authoritative form.

To Dr. C. B. Burr, of Flint, who has had the major part in the preparation of this volume, the profession of our state owes a great debt of gratitude. He has given unsparingly of his time and ability to produce this history of medicine in Michigan which has long been in our minds but is now a reality. The great fund of historical matter, the many anecdotes, the quaint humor, the excellent literary style, the close-ups of many past leaders make this a rare volume.

The book is well printed and bound, the illustrations are good. We are all very happy that the fruition of our efforts to produce a history of Michigan Medicine has been so fortunate. We shall await with eagerness the publication of the second volume.

THE BIOLOGICAL BASIS OF HUMAN NATURE—Dr. H. S. Jennings, New York. W. W. Norton and Company. 384 pages. Price $4.00.

This work renders a comparatively difficult subject intelligible to the educated layman. Outlines and popularization of scientific works are so often disappointing that one hesitates to recommend them. However, when the work of rendering a technical subject comparatively easy of comprehension is done by a master the result is often beyond criticism. Such is true of this book. What might be called the facts of biology, namely gens, chromosomes, their structure and function in the mechanics of heredity, are dealt with in a masterly way so that the perusal of the work will revive in the mind of the medical reader the knowledge of his early student days. Dr. Jennings' discussions of heredity and environment, and particularly the old controversy heredity vs. environment, as well as his discussion of the subject whether acquired characteristics or inherited, makes very interesting reading. Dr. Jennings also discusses in a clear and illuminating way the problem of eugenics.

THE COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION FOR 1929, Volume XXI. Edited by Mrs. M. H. Mellish, Richard M. Hewitt, M.D., and Mildred A. Felker, B.S. Octavo volume of 1,197 pages, with 279 illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $13.00 net.

There is so much in the twenty-first volume that it is very difficult to review it adequately. The Mayo Clinic and Mayo Foundation, as is well known, have not limited their researches to the clinical aspects of medical science, but have investigated the various fields of pure science. The present volume, however, is a selection that will prove of great service and interest to the general practitioner, the internist and the surgeon. The contents are divided into sections, fifty-three papers being devoted to the alimentary tract; twenty-three to the genito-urinary organs; fourteen to the ductless glands; twenty to the blood and circulatory organs. There are liberal sections dealing with the skin and syphilis, the head, trunk and extremities, the chest, brain, spinal cord and nerves; one section is devoted to technic. In addition there is a section comprising twenty-one papers on miscellaneous subjects. The volume is well illustrated wherever illustrations are found to add to the clearness of the text. There are so many subjects treated that we cannot imagine any physician who will not find a great deal of interesting and valuable information in this book.

OF GENERAL MEDICAL AND SURGICAL INTEREST

VIRUS DISEASES ATTACK NERVOUS SYSTEM*

Germs so small they cannot be seen by powerful microscopes frequently select the brain and spinal cord of the body as their point of attack, Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research, told the Washington meeting of National Academy of Sciences.

Infantile paralysis, and rabies, or hydrophobia, were cited by Dr. Flexner as excellent examples of these diseases in which the central nervous system is involved. The organisms are called viruses.

"The viruses themselves may be divided into two classes," Dr. Flexner said. "Those which tend to attack the central nervous system predominantly, and those which attack other organs with greater intensity and frequency than the central nervous system." Among the virus diseases which affect the central nervous system, Dr. Flexner mentioned smallpox, typhus fever, yellow fever, and measles in man; Borna's disease of horses; distemper in dogs and other animals; and psittacosis, which affects both birds and man. "We are just beginning to learn the frequency with which the central nervous system is involved in the virus diseases of man and of animals," he said.

CONGRESS MAY MAKE SURVEY OF HOSPITALS*

A complete survey of all hospital facilities in the United States may soon be undertaken by Congress. The purpose would be to discover available space which might be pressed into emergency service for sick veterans of the World War, who cannot be accommodated in Veterans' Bureau hospitals.

NATIONAL HEALTH INSURANCE INCREASING IN EUROPE*

The development of national health insurance is increasing along three lines, Dr. George F. McCleary, medical officer of the British Ministry of Health, said at the last of this season's De Lamar lectures at the Johns Hopkins School of Hygiene and Public Health, Baltimore. "The schemes in operation in the various countries differ considerably in regard to the proportion of the population coming within the scope of the scheme, the nature and extent of the benefits given and the relative costs falling on the insured persons, the employers and the State, but three broad lines of tendency may be observed," Dr. McCleary said. "The number of occupations made insurable tends to increase; the benefits in kind are relatively more fully developed and extended than benefits in cash; and an increasing effort is expended in preventive work." Health insurance on a national basis has had most important influences on the work of the medical profession in the various countries. Serious difficulties have been encountered, which, however, are believed to be in process of adjustment. Dr. McCleary outlined the development of mutual insurance against sickness, describing its place among the activities of the Guilds of the Middle Ages and the Friendly Societies in the 18th and 19th centuries. In 1884 sickness insurance on a compulsory basis was introduced into Germany by Bismarck and has since been adopted by most European countries, he said.

*Supplied by Science Service.

CULTIVATED TUBERCULOSIS GERMS CHANGE VARIETIES*

Evolution while you wait has been observed in cultures of tuberculosis bacilli by Dr. S. A. Petroff, bacteriologist of the Trudeau Sanatorium, N. Y., who reported his findings before a recent meeting of the National Academy of Sciences. From cultures of avian (bird) tuberculosis, Dr. Petroff has isolated what seem to be three distinct varieties of the germ. They grow differently, react differently to chemical and physical treatment, and have different physiological effects. One of the three types is quite virulent in its effects on chickens, the other two less so.

Similarly, from the tuberculosis of cattle a series of three cultured varieties was obtained. Their general appearance in mass was the same as that of the corresponding three types from the avian bacilli. They resembled them also in that one variety was strongly pathogenic, this time toward guinea pigs and rabbits, while the other two were less so.

Human tuberculosis germs proved less susceptible to separation into distinct strains or varieties. Dr. Petroff had best success with the long-cultured and somewhat vitiated "BCG" bacilli, which are used in the preparation of a vaccine widely used on infants in France. These bacilli separated out into two varieties, one of which had considerable effect on guinea pigs but little on rabbits, while the second variety appeared to be harmless to both animals. Cultures derived directly from human tuberculosis could not be separated into stable varieties. Dr. Petroff is of the opinion that human T. B. germs do produce many varieties, but that these do not "stay put" under laboratory conditions.

Dr. Petroff found it possible to convert one type of his bacilli into another by suitable culture methods, changing a virulent form into a mild one and vice versa.

This variability of the bacilli of different types of tuberculosis, and the instability of a variety that workers may succeed in isolating, agrees with fluctuating changes that have been found in other bacteria. The physiological changes that take place in the germs may supply a basis for the understanding of the wide variability in tuberculosis as found in human patients, which has always been a puzzle to doctors.

DOCTORS ASK FEDERAL RESEARCH ON DISEASES THAT SHORTEN LIFE*

Arteriosclerosis took former Chief Justice Taft from his country at the age of 73. Until a few weeks before his death his brain functioned unimpaired, "yet that disease, insidiously digging, perhaps for 50 years, had been taking his life, and is today slowly taking the lives of the most productive minds of this country." People are dying too young of cancer, pneumonia and arteriosclerosis. So declared Dr. Joseph Colt Bloodgood at a hearing before the House Interstate Commerce Committee on the Ransdell bill which would turn the Hygienic Laboratory of the U. S. Public Health Service into a big national health institute, where an enormous amount of medical research would go on, where fellowships would be given to M.D.'s and Ph.D.'s so that they may, with a clear economic conscience, devote years of their life to solving medical and health problems.

The bill has been before Congress for four years. It has passed the Senate this session, and action in the House is expected, for, as a result of the committee hearing, the House Interstate Commerce Committee will report it out favorably within a few days.